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Men and sex - constructions of male sexuality and their implications for HIV prevention in urban settings in Kenya and South Africa

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ABSTRACT

Background The perspectives of heterosexual males who engage in high risk sexual behaviours with large sexual networks and concurrent partners are scarcely documented, but these are crucial in the understanding of the high HIV prevalence. Little is known about the sexual life and sexual risk reduction strategies in poor-resource, high risk settings in relation to increased access to antiretroviral treatment (ART) in sub-Saharan Africa

Aims The overall aim was to explore male sexual risk behaviours and sexual risk reduction strategies in urban resource-poor settings in sub-Saharan Africa with implications for sexually transmitted HIV and prevention strategies.

Methods In Sub-study 1 (Papers I – III), twenty in-depth, open-ended interviews with South African men who had multiple and concurrent sexual partners were conducted. Sub-study 2 (Paper IV), twenty in-depth interviews were undertaken with male patients. A Thematic Question Guide with open-ended questions was used for the interviews. Sub-studies 1 and 2, a latent content analysis was used to explore the characteristics and dynamics of social and sexual relationships as well as alcohol as facilitating factors for high risk sexual behaviours (Papers I – III), and sexual risk reduction strategies among men on ART (Paper IV). Sub-study 3 (paper V) was a cross-sectional study, where 515 consecutive adult male and female patients on ART were interviewed about their risk behaviours. Interviewers used structured questionnaires and SPSS for Windows (version 17.0) was used for statistical analysis. Bivariate and multivariate logistic regression models were performed to assess the association between explanatory variables and the outcomes of consistent condom use and a dichotomized number of sexual partners in the previous six months

Findings In Paper I, a high number of concurrent female sexual partners, geographic mobility and high levels of unprotected sex were common. Male core groups provided mutual economic and social support for the pursuit and maintenance of these networks. Reasons for large concurrent sexual networks (Paper II) were the perception that women were too empowered, could not be trusted, and men had a lack of control over them. Biological determinism further reinforced strong, negative perceptions of women and female sexuality, which helped polarize men's interpretation of gender constructions. A latent association between alcohol and the formation of casual sexual partnerships characterized by exchange, where the potential pathways by which alcohol use and transactional sex are linked (Paper III). Paper IV showed experience of prolonged and severe illness prior to the initiation of ART. Fear of symptom relapse was the main trigger for sexual behaviour change. Partner reduction was reported as a first option for behaviour change and condom use was perceived as more difficult as it had to be negotiated with female partners. In Paper V, almost one third of patients reported inconsistent condom use, indicating frequent unsafe sexual events. Male patients were significantly more likely to use condoms compared to females (82% versus 65%). Longer time on ART was significantly associated with consistent condom use. Multiple sexual partners were more common among married men (adjusted OR 4.38 95% CI 0.82 – 10.51) compared to married women.

Conclusions There are problematic gender dynamics that clearly affect HIV prevention efforts in urban resource-poor settings. Interventions targeting men at high risk of HIV need to challenge current societal norms of masculinity to help promote individual sexual risk-reduction strategies. ART needs to be accompanied by other preventive interventions for increased community effectiveness to reduce the risk of an increasing number of new HIV infections among sero-discordant couples and others. This is important for the donor community and policy makers, who are the major providers of programme support within weak health systems.

Keywords: HIV, Aids, ART, Masculinity, Sexuality, Gender, Africa, Urban resource poor settings

LIST OF ORIGINAL PAPERS

- I. **Ragnarsson, A.**, Townsend, L, Thorson, A, Chopra, M, Ekstrom, A. M. (2009).
“Social networks and concurrent sexual relationships -a qualitative study among men in an urban South African community.”
AIDS care **21**(10): 1253-8
- II. **Ragnarsson, A.**, Townsend, L., Ekstrom, A. M., Chopra, M., Thorson, A. (2010).
“The construction of an idealised urban masculinity among men with concurrent sexual partners in a South African township.”
Glob Health Action **3**
- III. Townsend, L, **Ragnarsson A**, Mathews C, Johnston LG, Ekström AM, Thorson A and Chopra M (2010).
“Taking Care of Business”: Alcohol as Currency in Transactional Sexual Relationships Among Players in Cape Town, South Africa”,
Qualitative Health Research (Published online awaiting print publication)
- IV. **Ragnarsson A**, Thorson A, Dover P, Carter J, Ilako F, Indalo D, Ekström AM (2010).
Sexual risk reduction strategies among HIV infected men receiving ART in Kibera, Nairobi
AIDS care (In press)
- V. **Ragnarsson A**, Anna Mia Ekström, Jane Carter, Festus Ilako, Abigail Lukhwaro, Gaetano Marrone & Anna Thorson.
Sexual risk taking among patients on antiretroviral therapy in an urban informal settlement in Kenya: a cross sectional survey
Submitted

The papers will be referred to by their roman numerals.

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ABBREVIATIONS

ABC	Abstain, Be faithful and Condomize
AIDS	Acquired Immune Deficiency Syndrome
AMREF	African Medical Research
aOR	Adjusted Odds Ratio
ART	Antiretroviral therapy
ARV	Antiretroviral
CBD	Central Business District
CD4	Cluster of Differentiation
CI	Confidence Interval
HIC	High-income Country
HIV	Human immunodeficiency virus
KAP	Knowledge, Attitude and Practice
KEMRI	The Kenya Medical Research Institute
LGBT	Lesbian, Gay, Bi and Transgender
MDG	Millennium Development Goals
MRC	Medical Research Council
NGO	Non Governmental Organisation
OR	Odd Ratio
PEP	Post-Exposure Prophylaxis
PEPFAR	The US President's Emergency Plan for AIDS Relief
PLHIV	People Living with HIV
PrEP	Pre-Exposure Prophylaxis
PTMTC	Prevention
RDS	Respondent Driven Sampling
RNA	Ribonucleic acid
RCT	Randomised Controlled Trials
SADC	Southern Africa Development Community
SI	Structural Intervention
SPSS	Statistical Package for the Social Sciences
SRHR	Sexual Reproductive Health and Rights
SSA	Sub-Saharan Africa
STI	Sexually Transmitted Infection
TQG	Thematic Question Guide
UN	United Nations
UNAIDS	The United Nations Joint Programme on HIV/AIDS
VCT	Voluntary Counselling and Testing
WHO	World Health Organization

INTRODUCTION

Since HIV (Human immunodeficiency virus) was first identified in the beginning of the eighties, the pandemic has manifested itself in unpredictable ways and few could visualise the magnitude and dramatic impact of the pandemic 30 years later. An estimated 40 million people have already died from Acquired Immune Deficiency Syndrome (AIDS) and in 2008, an estimated 33.4 million [30.1 million—35.8 million] people were living with HIV. The annual number of new HIV infections has declined from 3.0 million [2.6 million—3.5 million] in 2001 to 2.7 million [2.42 million—3 million] in 2008 [1], but with large global variations and some of the reduction of new infections may partly also be influenced by new and better ways of measuring HIV incidence.

Even though all countries in the world are affected by the HIV pandemic, there are vast differences between and within countries and sub-populations, where several nations still report very high numbers of newly infected individuals each year. This illustrates the massive burden of illness, where HIV is a leading cause of mortality in sub-Saharan Africa (SSA) [2]. The HIV epidemic not only brings human suffering, along with stigma, shame and denial to those infected and affected on an individual level, but the consequences on a macro level were detected early on as a major problem. Following the high numbers of deaths and illness related to the epidemic, it has eroded many low- and middle-income countries of the human capital and economic growth necessary for their stability and development, impacting negatively for example, on different public sectors' service provision [3]. In the light of this, the United Nations (UN) set out to achieve universal access to treatment for HIV infection by 2010 and to halt and reverse the spread of HIV by 2015, which is targeted in the Millennium Development Goals (MDG). This has just recently been re-emphasised as the UN General Assembly adopted a resolution (60/262 Political Declaration on HIV/AIDS) whereby the member states commit themselves to a number of key areas in the fight against HIV. In the resolution, nations and governments note with alarm that we are facing an unprecedented human catastrophe. It is clearly stated that the global HIV epidemic cannot be reversed, and that gains in expanding treatment access cannot be sustained, without greater progress in reducing the rate of new HIV infections. The resolution further stresses the pertinence of strong prevention strategies as a means to meet the MDGs [1].

The global emergency of HIV is today well articulated, where multi-lateral organisations, bilateral donors, governments and other actors are all more aware of the situation and are to a greater extent involved in combating the epidemic. This is for example, reflected in a six-fold increase in financing HIV programmes in low- and middle income countries between 2001 – 2007 [1]. However, due to the recent global financial crisis, there is a concern within the donor community that less money will be spent on preventive initiatives and has been a concentration on treatment. The investment of recent years has largely targeted up-scaling and access to antiretroviral treatment (ART). Preventive efforts have been given less attention as the emphasis shifted from prevention to treatment in the 1990s [4].

In the light of these uniform responses, there is a need to understand that the HIV pandemic is characterised by its disparity and that HIV manifests itself differently according to contexts

and has a wide array of factors that affect potential risks for HIV transmission. In line with the global commitment, the HIV epidemic has also called on a massive research response, mostly biological studies and behavioural survey research. These in large part, have provided a limited understanding of the meaning of sexual encounters [5]. Thus, there is still the need for new and more innovative research on sexuality to inform preventive efforts for more substantial changes in the future that will impact strongly on the epidemic.

Socio-cultural and contextual factors affecting the HIV epidemic

The HIV epidemic is a global concern, but there are large differences between and within continents, countries and places, as well as between defined sub-groups and populations. There are also vast differences in how active governments have been in the fight against HIV. Some countries were late to react and were even in denial until very recently, for example in South Africa [6, 7]. The reason for this might be the nature of virus where the route of transmission is highly dependent on human practices as well as societies at large. Most HIV infections in SSA occur during sexual activities where the virus enters the body via contact with body fluids or the mucous membrane. HIV demands a very high level of social interaction for its transmission and thus forces people's behaviour, and societal norms and culture into the core of the discussion, including the physiological, psychological as well as the social dimensions of human sexuality. Research on socio-cultural factors has contributed to this discussion; predominantly with alternative ways of understanding those HIV related issues not covered by biomedical approaches. It gives attention to cultural, economic, psychological and social issues, partly or totally ignored by health care professionals, decision-makers and public opinion [3]. Further, given the vast contextual differences in the epidemic in which the HIV transmission occurs, it is essential to allow for appropriate tailoring of interventions [8].

Migration and urban resource poor settings

Urban low-income and informal settings are unique in their respective ways, but have also many similarities where context-bound hazards affect people's vulnerability to HIV and other health concerns. The growing urban population was identified early on as providing environments conducive to the spread of HIV. This has shown to be even more so in low- and middle-income countries that have seen an emerging public health crisis as a result of a sudden concentration of small geographical areas where an uncontrolled and rapid influx of people was accompanied with little or no infrastructural planning [9]. More than half of the world's population is living in urban areas at this time and it is estimated that the global urban population will double by 2030 in Africa and in Asia, making up 80 percent of urban humanity [10]. Migration into cities has profoundly affected HIV transmission in Africa, where reduced social cohesion easily destabilizes contexts and new sexual relationships are easily formed. In addition, limited access to health care and widespread poverty are both contextual factors making people vulnerable to HIV infections [11, 12]. Whilst much attention has focused on the sheer scale of urbanization, most of the public health challenges are actually arising from the rapid pace of this urbanization [9].

Peoples' social identities are formed on the basis of self-definitions that arise from membership of particular social groups and place and are shaped by gender, ethnicity and socio-economic positions. As social identities are reconstructed over time and evolve on the basis of collectively sanctioned norms, so do health related behaviours and actions [13]. This means

that new sexual practises will occur and produce and reproduce new forms of norms unique for each context. Urbanisation per se brings together groups with different traditions and thus weakens reciprocal control and results in the collapse of collectively maintained behaviours. [14]. Therefore, it is of central importance to understand these contexts and what implications they have on the HIV epidemic as well as possible prevention designs.

Furthermore, in specific social contexts, immigration, labour migration, refugees, tourism and a high use of different, new mass media technologies are examples of exposing factors through which images are mediated and in disjuncture with each other [15]. The use of social context here is to provide cultural diversity analytically. By this, the social context works as an institutionalised frame that contains certain types of practices, ways of thinking and consequences of this [16]. From this perspective, urban social contexts shape unique systems of social and sexual interaction between their inhabitants and others. This affects the HIV epidemiological development - its characteristics, as well as vulnerability on both an individual level and on a structural level. Thus, places investigated are spatially constituted social structures and centres of collective consciousness and socio-spatial identities [17], which need to be understood and incorporated into the analysis of the transmission of HIV.

Sexuality

HIV interventions are dependent on an understanding of sexuality in the context it occurs and the factors that affect an individual's possibility to reduce the risk of an HIV infection. Sexuality is loaded with multiple meanings such as love, lust, pleasure, reproduction and the unique bond between people. The understanding and depiction of human sexuality has taken different forms in history, often expressed through art and in poems and song lyrics, as important expressions in the representation of something highly essential to human beings. Thus, the exploration of sexuality largely dealt with lust, love and desire of the object of one's affections or the sexual act. However, the portrayal of sexuality intensified in the last part of the 20th century when scholars, philosophers and others in their own way, started to define a more multilayered human sexuality [18].

Different discourses on the origin of human sexuality had an initial focus on reproduction, which was later contested via the meaning of sex as a recreational act. For example onanism, the practice of ejaculating outside the vagina or masturbating in a sexual act without reproductive purposes clearly counteracts this focus. It has been widely debated if birth regulation and birth control contested the meaning of sex for reproduction, moving towards an interpretation of reproduction as a by-product of sexual pleasure [19]. These perspectives were strongly opposed by religions and especially Christianity in the colonial era, leaving strong moral imprints in peoples mind concerning sexuality. Historically, Christian ethics on sexuality have been a strong regulatory element, where pleasure versus reproduction within congenital bonds has always been a forum for strong emotions [20, 21].

The social construction of human sexuality, whereby institutions and distal factors direct individuals in their sexual lives is more of interest today. As more research includes other dimensions of human sexuality - the evolution of culture and the social construction of sexuality - where recreational sex leads us beyond reproduction, and includes a whole set of physiological, psychological and socio-cultural dimensions at the core of the issue. Sexuality could be defined as a multidimensional and dynamic social construction of physical and psychological aspects of a human biological drive. Therefore, neither gender nor sexuality are constant factors, but change along with different historical and social structures and the complexity of the contemporary life of people [22]. By this, sexuality is an essential part of forming people's identity and

reflects individual positions in stratified social contexts. Strong social connotations highlight a contextual and cultural evolution of sexuality as a whole. Therefore behaviours and norms differ largely from place to place, incorporating all aspects of society with strong imperatives on the regulations on how people are expected to live their sexual lives. It has often been assumed that sexual behaviour is shaped by the conscious decisions of rational individuals, who could be approached for preventive purposes on an individual level [13].

This has however proven to be more complex and difficult. The understanding of culturally specific symbols and acts was one thing Malinowski used, as early as 1927. He criticised the psychodynamic theory and the lack of social understanding and cross cultural analyses in the work of Freud and others. The social context was stressed as very important for human emotional and sexual life, with different factors setting the frames, and including possibilities as well as hindering factors for sexual development on a personal level [23]. An individual's sexuality is thus closely interlinked with a person's social identity or persona, the self as self-construed, with possible changes according to specific situations and contexts, reflected by intermingled power dynamics in the social arena, which is a socially negotiable phenomenon and not just an individual matter [13]. Campbell further stresses this in her book on HIV prevention programmes and the importance of identity and the social context:

“Rather than being static, permanent or given, social identities are constantly constructed and reconstructed from one moment to the next. This process of construction takes place within social contexts that enable or constrain the degree of agency that people have to construct identities or to behave in ways that meet their needs or represent their interests.”

This challenges the individualistic perspective, bringing a person's social context into the core of the analysis. While this has often been stressed, it has rarely been implemented in public health, behaviour, epidemiological and psychological research.

In a world of different social and cultural contexts, sexual practices and socialised values on sexuality are not universal. Rather, they are symbolic products in a specific social environment and in the characteristics of the community [24]. Such a perspective has to lead us away from an ethnocentric standpoint, or at least opened up our minds to other ways of expressing sexuality and knowledge about it. This is even more important today as a sensitive dialogue around a uniform “African sexuality” has been widely debated. It has also forced many leaders into denial and for this reason has delayed political commitment and preventive efforts targeting sexual issues and HIV. There is now more and more literature, raising criticism against the *othering* of African sexuality. This is where the understanding of sexuality is drawn from colonial and post-colonial images; where sexuality has often been viewed as lascivious, and still has a strong legacy in the interpretation and views of African people's sexuality [6]. In this tradition, many researchers have tried to describe and address a uniform “African sexuality” - often viewed as a pathological, perverse and a primitive construct [25, 26]. However, defined sexual risk practices such as concurrent partnerships, transactional sex and age discordant relationships, vary greatly across Africa, as well as between socioeconomic and ethnic groups [7, 27-30]. Contemporary research has however aimed at moving away from earlier misleading generalizations, and instead looked into context specific features of sexuality and socio-cultural vulnerability to HIV transmission [6, 31]. However, this does not mean that research should or

can take a cultural relativistic standpoint when viewing sexual practises in different populations or sub-groups. In relation to HIV and other sexually transmitted diseases and reproductive health problems, there is a need for an open discussion around different sexual practices that may be culturally acceptable but nonetheless need to be contested for public health reasons.

In the light of this, the HIV epidemic has in many ways put African sexuality, behaviour and practice in the spotlight globally as a major public health issue. Often, this is done with inadequate understanding of structures and processes influencing sexuality, especially male sexual behaviours [22]. Further, included in this contemporary sexuality research is a dominant focus on the ‘other’, with emphasis on areas such as homosexuality, sex workers, paedophiles, sex tourism and more. With the emerging HIV epidemic in the 1980s, the consequences of the long term neglect of sexuality and related health issues became apparent [32]. In this wave, the HIV epidemic strongly revitalised the work and study of human sexuality in a completely new way, with new force and in an interdisciplinary manner. Generally, there is a lack of interdisciplinary research cutting across social sciences, biomedical sciences and other sciences in a way that helps in the critique of related programmes and health policies. Such an approach can lead the way for a new understandings of public health issues concerning sexuality [33].

From a public health perspective, sexuality and HIV need to be analysed and informed by both biomedical sciences and other disciplines as well as from a socio-cultural perspectives. They must be interlinked for preventive interventions in order to improve the health status of selected populations. This might be even more important when discussing sexuality and HIV, as the topic is often viewed as highly sensitive and difficult to discuss in public. It is for example important to acknowledge that the viral load is a main predictor of HIV transmission, and infectivity is much higher during the initial weeks after the infection [34-37]. Thus, not to acknowledge the biomedical basis and characteristics of the virus in relation to specific contexts is to overlook key dynamics for an epidemiological development and ill health in specific populations, as well as potential weaknesses in prevention efforts. There has however been a switch in focus recent years, where sexual reproductive health and rights (SRHR) are now more emphasised on the international agenda and WHO has elaborated on the issue (but is not a official statement as the WHO definition is still being debated and revised):

“Sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence to attain the highest possible standard of sexual health including access to sexual and reproductive health services” [38].

Furthermore, the link between HIV and SRHR is integral to all work undertaken, where human rights issues related to sexuality are strongly emphasised. However, there has been a tendency to focus on women and their (reproductive) needs while men and their reproductive and sexual needs have been largely ignored. This is reflected in the small number of programmes targeting men and their sexual needs as well as specific clinics for men’s sexual and reproductive health. However, due to poor results in the women-focused approach, there is now a shift in perspectives and men’s sexuality is strongly stressed in both research and in policy documents, although well developed interventions and health services are still lacking to a large extent, especially in resource-poor settings [1, 38-42]. Because many people are living their life unaware of their HIV status and because more people are today living with HIV (PLHIV), it is highly important

to emphasise the work on prevention among both HIV infected people. It is not sufficient to limit prevention to the general population in order to minimize the risk for sexually transmitted new infections. Research on ART in relation to sexual behaviours in low-income contexts is a fairly new field, but several studies in high-income settings have shown an increase in risky and unprotected sexual encounters among people on ART, and that large numbers of high-risk HIV events with resistant virus are taking place [43-45]. Furthermore, as many PLHIV return to a normal life, having reproductive wishes and sex lives, the issue of sexuality cannot be ignored and remains a major challenge for potential preventive efforts. In Africa, between 5 - 31% of married or cohabitating couples live in a sero-discordant relationship [46-49]

The construction of gender and masculinities

As described above, the socio-cultural construction of sexuality in specific social contexts is key to the interpretation. It is therefore vital to view and understand the concept of gender in relation to biological sex [50]. Contemporary studies on sexuality have largely originated from the women's movement, LGBT (Lesbian, Gay, Bi-sexual and Transgender) and queer theorists often contesting the dominant heteronormativity in the "Western" world. Furthermore, most medical and public health research has not dealt with gender per se, nor has it had a wider understanding of the concept. Depending on the health outcome, both, neither or one or the other may be relevant as sole, independent or synergistic determinants [50]. Beyond the physical determinants of sex, the term gender is more commonly defined as the deeply rooted, socio-culturally constructed expectations of women and men that influence their behaviours and opportunities in society. Gender is socially constructed, produced and reproduced through peoples' actions [51], and it is directed by the social context in which people enact their lives. Using the term gender as a dichotomy, divided into two non-overlapping parts is a simplistic way of viewing gender. Gender should not be understood as a synonym for women and/or men as it excludes varying and changeable attributes given to men and to women. In social science, this has been bypassed via a focus on social relations, structures, practises and arrangements, which are all brought into social processes [5].

However, contemporary gender research does not primarily focus on men and women, but rather on how womanliness and manliness are constructed as unequal categories, especially where the distribution of material resources and power is of central importance. So from this perspective, the construction of gender is linked to societal processes involving class, age, sexuality, ethnicity and more, where gender can be self defined, ascribed or imposed and it influences behaviours and opportunities in various social contexts such as schools, workplaces, families and health systems and it affects human health and wellbeing [51]. Thus, the constructions of gender vary in different contexts, and HIV transmission has to be understood within these existing explanatory systems, particularly in terms of associated images and symbols [52]. These gender structures profoundly influence an individual's sexuality where the gender dynamics play key roles in determining many aspects of a person's risk and response to HIV including: an individual's vulnerability to infection; perceived risk and actual risk-taking behaviour; differential exposure to HIV; knowledge and access to health information; health-seeking behaviour; the utilization of services for treatment, and the ability to cope when infected or affected by HIV.

Furthermore, gender inequalities and power dynamics in relation to violence and HIV are closely linked and further stress the importance of a gender perspective. It has been shown that intimate partner violence places women at an increased risk of HIV infections [53], due to deeply rooted social and cultural processes and is thus rooted in ideals of gender identities

[54]. Power imbalances in relationships that legitimize abusive acts are supported at the macro level of society. For example a man's perceived right to access sex if, for example, any form of perceived transaction (financial, material or other forms of reciprocal relation) has taken place is sanctioned and reproduced contextually [41], and it can be stressed that idealized forms of masculinity create and support structures that legitimize possible abusive actions [55, 56]. This is further supported in statistics on domestic violence, sexual assault, and rape in for example South Africa, that show that the incidence of these events is alarmingly high [57-62] and where men who are violent towards their partner are more likely to be HIV-positive [54]. This points towards problematic gender constructions, which from a public health perspective are extremely important, and cannot be ignored as such information depicts a harsh reality with possible implications for HIV transmission.

Today, it is well acknowledged that gender is the key to the fight against HIV as it is seen as an epidemiological driver. But despite a strong emphasis among the global health community on gender inequality in relation to HIV, there are still very few programmes geared to effectively deal with gender issues effectively [63]. One such key issue is that discussions about gender in the global fora have had a tendency to be female-orientated and lack the perspective of men or configure women as victims, not sexual actors, thus positioning men as predators. Furthermore, many norms and legislative acts concerning sexuality habitually exclude many groups of men, such as men who have sex with other men (considered an illegal activity in many countries) and thus exclude this group from the ordinary public health system or targeted interventions. There has however been an emphasis on different structural positions and power dynamics of women (in relation to men), and less attention has been given to men and masculinity. This has lately taken a different turn and now a stronger focus on men and boys is stressed for more effective intervention design [1]. But despite this, little has actually been undertaken or there are only small scale projects piloted by NGOs in the region.

As discussed above concerning gender, masculinity follows the same principle of the social construction in a given context in which the individual acts as a social being [64]. In this way the dynamics of masculine social identities or masculinities, which involve class, age, sexuality and ethnicity, influence men's interaction with women [65, 66] and affect behaviours in a variety of social contexts, which in turn affect HIV transmission. [52]. In the 1990s, there was a shift in the analysis of masculinity among academics and others, moving away from a singular and unitary conception of masculinity and gender roles. The concept of masculinities, and that of particular versions of masculinity are not only constituted in relation to their differences from other versions of masculinity, but are also defined in relation to femininity [67]. Thus different versions of masculinity exist and are coded in language and images that make sense (but may not be widely accepted) in context and are pertinent in communication and social relations. The multitude of masculine ideals is very visual in the contemporary global landscape where mass media and technologies have taken a strong position in portraying particular versions of masculine (and sexual) ideals. This modernisation is not a prerogative of selected parts of the world, but these new mass technologies have had a global impact, especially in urban environments, and have accelerated the process of creating and distributing ideas and concepts of the other and the self. Men, as social actors, employ cultural symbols and conceptual systems, linguistics and other representational systems to construct meaning to their world [68] and are shaped and reshaped in response to cultural, historical, socio-economic and political factors that promote alternative ways of expressing manhood.

One concept widely used in contemporary masculinity research is that of a *hegemonic* masculinity where relations of cultural domination represent a cultural ideal. This explains

that different masculinities coexist, and should be defined as *masculinities* that are contested, constructed and reconstructed, and confirmed in context [5, 69]. In context, people's social identities (and thus their masculinities) are formed as aspects of their self-definition that arise from membership of particular social groups. In turn, self-identity is shaped by factors such as gender, generation, ethnicity and socio-economic position, which affect health-related behaviours. These in turn are shaped and constrained by collectively negotiated social identities [13], which are of vital importance in the makeup of masculine identities, which shows that the discourse of masculinity is a multilayered and complex process developed through history [67]. This is even more important among marginalised men who often attempt to compensate for a subordinate status by adopting alternative forms of masculinity [70], which can include accentuated forms of muscular and hyper-sexual masculinity

Depending on their position in the social structure, men are both constrained and enabled to take on certain forms of gendered social actions. This is especially evident in different African contexts where factors such as social, tribal, economic, migration and political changes have left a highly complex mix of gender identities. Trends in mobilisation are often strongly linked to the economic and political situation in countries, with push and pull effects that disrupt coherent social systems and allow new relations to be formed. The migration into urban agglomerates was initially a process where most cities were nodes in the colonial administration, which needed a male workforce, and thus were inhabited by mostly men from various backgrounds. This had early on profound implications on the gender dynamics where men and women took on new roles and responsibilities. Furthermore, political structures such as apartheid in South Africa had a systematic labour migration where men often had to leave their families to work in other settings, in for example the mining or farming industry, which further increased social instability. Therefore, a hegemonic masculinity is expressed differently in contexts and situations and is thus dependent on its history [66, 69]. Characteristics of behaviours and factors for sexually transmitted HIV are especially evident in informal urban settlements in Africa that have produced and challenged masculinities. Men have survived extreme hardship, combining prior knowledge with new strategies to form new urban masculinities, not least in relation to violence, sexuality and ways to express dominance [62, 66, 71, 72]. Thus, the use of masculinities and in particular that of a hegemonic masculinity is the key to meeting challenges in the future. An understanding of how dominant masculinities and power dynamics in relationships affects HIV transmission and how they can be an integral part of intervention design must be part of both the research, policy and implementation agenda [73].

HIV prevention – a broad overview of strategies for HIV control

Since the HIV epidemic became more widely acknowledged in SSA, about 25 years ago, intervention efforts have been made to various extents and with various results, aiming at protecting people from being infected by HIV. Few predicted that effective HIV prevention strategies could be so difficult to achieve and as a result, a large number of new infections occur every year in SSA, predominantly among the younger generation. By looking at current sero-prevalence maps for Africa, the failure in prevention programs is obvious as the prevalence and incidence in many places have stabilized at extremely high levels [74]. For many African states, political commitment has been weak and the denial of the link between HIV and AIDS has hampered effective interventions. In addition there are competing ideas on illness, treatment and prevention options, which have in many cases delayed an effective response [7, 75]. However,

there have been many different interventions considered through the years, and as the concept of intervention implies, these actions have often been taken by outsiders.

It is more likely that new infections take place during the early stages of the infection when most people are still unaware of their HIV status. Furthermore, other markers related to the biology of humans are: forms of penetration, forced sex, not lubricated (due to specific practise, psychological or other reasons), young ages due to immaturity of genital tracts, differences between sexes concerning the surface of the mucus membrane (including circumcision), other genital tract infections, and the duration of exposure to semen [38]. There are of course many other biological factors that increase the risk of HIV infections and it is important to incorporate this knowledge into the analysis of HIV and sexuality and how to prevent sexually transmitted HIV. To reduce the risk of sexually transmitted HIV, several methods are considered as safe or safer sexual practice, but not all of these risk reduction strategies are absolutely safe in terms of contracting HIV. Examples of such practices, where we can regulate and reduce the risk of HIV transmission as well as pregnancy and other sexual transmitted infections, are for example, abstinence, masturbation, faithfulness, petting, condom (male or female), oral sex, coitus interruptus, male circumcision and maintaining a low viral load via ART [38]. These strategies, and others, have to various extents been promoted in HIV programmes as options to reduce the risk for new infections, working on both individual as well as structural levels, where some have been more predominant than others. Structural levels for interventions refers to factors such as physical, social, cultural, organisational, community, economic, legal and policy aspects of the environment that impede or facilitate a person's effort to avoid HIV infection and by this locate the source of public health problems in factors that shape and constrain individual, community and societal health outcomes. However, in the wide range of initiatives, including for example social marketing of condoms, entertainment-education, peer education, school based education and other small or large scale interventions, they almost always appeal to individual behaviour change.

VCT – Voluntary Counselling and Testing

VCT, as a strategy, is an integral part of HIV prevention. It combines personalised counselling to inform an individual of their HIV status or to advise a couple in order to motivate, support or to take on new or maintain behaviours that will prevent transmission of the virus [76]. The strategy has lately been advocated for, not least by World Health Organization (WHO) and AIDS policy lobbyists, who argue that VCT could contribute significantly to public efforts to change behaviour and reduce HIV transmission. Some researchers have even gone further in mathematical modelling, saying that universal VCT and immediate initiation of ART could eliminate the epidemic [77]. Others state that the predicted impact of VCT is modest, but that improved programmes could generate substantial reductions in incidence and thus reduce the need for ART in the long-term, but it will not be sufficient to bring the epidemic under control [78]. However, most people in low-income settings are diagnosed very late in their disease progression, often when they have developed full blown AIDS or stage 3 – 4 according to WHO criteria, which prompts, if possible, immediate initiation of ART. This means that these individuals often have been unaware of their HIV status for several years, which has important implications for transmission [34-36]. From this perspective, interventions aimed at recruiting people to VCT for early detection have not been as effective as intended.

In a meta-analysis of studies undertaken in low income countries, VCT had an effect on condom use but no significant effect on sexual partner reduction. With only moderate evidence of the preventive effects of VCT [76] the strategy has had limited impact so far, at a population level [79]. However, previous research has shown that VCT might be more effective at targeting discordant couples than other groups at risk [80], but that the effect varies to a large degree, depending on the population and the design of the VCT programme [76]. Other limiting factors are inherent in the programme design in that the post-test counselling is focused on HIV+ people and there is also too much effort expended on pre-test counselling in low-resource settings. Assumptions about both sexual behaviour change due to knowledge of HIV status due to VCT, as well as secondary prevention in the form of reduced viral load, are difficult to establish from existing evaluations of VCT [81]. VCT as a preventive tool could in theory affect HIV transmission, but there is still no evidence of long term sexual behaviour change. As a tool to meet the goal of life long treatment via ART, if patients are eligible, a uniform intervention is stressed with little contextual understanding of sexual behaviours and needs. This is especially evident if competing health systems are appealing to the individual to make informed choices, and where the understanding of sexual health is based on local and contextual interpretations of related illnesses [82].

Abstain, Be faithful and Condomize – the ABC approach

One of the more dominant preventive interventions that have been in focus during the last two decades has been the so called ABC approach, i.e. Abstain, Be faithful and Condomize. This approach has had strong elements of moral and Christian values in the messages delivered, often trying to persuade people to adopt a certain form of behaviour with a strong emphasis on abstinence. This becomes even more forceful when the donors and actors, particularly those from the USA and PEPFAR (The US President's Emergency Plan for AIDS Relief) or from faith based organisation, have stressed abstinence. Furthermore, funding for interventions can only with considerable difficulty be used by receiving organisations to distribute condoms or other preventive initiatives [83]. Thus, many national policies on sexual health programmes have largely been powered by donor-driven normative views, where sexual abstinence has been promoted and condom use (more often) condemned [38]. Some donors have had the (financial) power to force a Christian, right-wing perspective or ethnocentric normative view of sexual health, that actually has a negative effect on combating the HIV epidemic [74]. The ABC model, often with the emphasis on abstention, has been strongly supported financially with incorporated moral messages and as a result, more comprehensive prevention efforts have been difficult to develop and maintain [38, 84-87]. However, despite its strong political and religious support, the ABC strategy has been widely criticised lately. The strategy is limited by the underlying assumption that individual decision making is central to risk minimization of HIV transmission and so it ignores the gendered context in which the strategy is going to be executed [73]. At worst, these strong moral messages can be counterproductive and drive people into sexual secrecy if they are not living up to communicated norms [88].

In this international debate, condom use has been a highly controversial and provocative issue, not least in the eyes of the Vatican and some donor countries. This is despite the fact that research overwhelmingly demonstrates that consistent condom use is highly effective in preventing sexually transmitted HIV [8], and that it is possible to achieve increased condom use in interventions. This however is dependent on the type of partnership and risk perception

among those targeted [89]. However, the effectiveness of condoms is often far from the calculated efficacy of condom use and it is nearly impossible to actually measure the efficacy in interventions targeting condom use. The term efficacy refers to how well an intervention prevents a condition when it is used perfectly and effectiveness refers to how well it works in practice. The efficacy and effectiveness disparity applies to all preventive interventions, where planned interventions need to assess these factors [90]. If the condom is used correctly, the risk of infection is very low but it is considered to be 90% effective in preventing HIV transmission in practice [91]. Many factors direct the use of condoms, i.e., with whom, when the condom is used or how correctly it is used. Other factors that strongly influence this are the influence of alcohol or drugs or cohesion in sexual encounters. Despite evidence of the efficacy of condom use, the practice has not reached a sufficiently high level, even after many years of widespread and often aggressive promotion, to produce a measurable slowing of new infections in the generalised epidemic of SAA [79].

Male circumcision

The preventive effect of male circumcision on HIV infections has been discussed for many years, where observational and ecological studies yearly indicated a relation between circumcision and low HIV prevalence [92, 93], and should therefore be promoted [94-97]. In 2005 and in 2007, three randomized control trials (RCT) in Kenya, Uganda and South Africa showed that male circumcision reduced the risk for HIV transmission by 50 – 60 % between women to men [98-100]. However, others have stressed that the shown efficacy in RCTs is difficult to replicate in natural settings where the actual effectiveness might be much lower due to increased risk taking (the Peltzman effect¹). Thus, the documented positive outcomes of circumcision do not take into account factors that might have implications for community effectiveness of a preventive programme and a potential increase in risk behaviours [101]. For these reasons, the practice of male circumcision has lately been widely debated, where some promote male circumcision as the magic bullet for reducing transmission of HIV, while others see it as being taken out of context, and that confounding factors might counteract the intended efficacy of circumcision. Furthermore, there is no evidence that women are protected. In a study in Uganda, no effects on male to female transmission were shown and the study had to be stopped [102].

Theoretically and on a population level, with fewer men infected, women would benefit secondarily as the overall incidence of HIV among circumcised males would decrease. As a preventive intervention, male circumcision has several challenges to meet. Firstly, it has to be economically viable, as this intervention will compete with other medical procedures. Secondly, other risk compensations need to be prevented as there are risks that men might believe that they are immune to infection (as well as to transmitting HIV) and thus increase their sexual risk taking and thereby, the efficacy will be drastically reduced [103]. Risk compensation in relation to male circumcision is today largely unknown and needs to be further researched as it is highly contextual, where strong traditional values are associated with the practice. Often, circumcision is part of the transition into adulthood accompanied with guidance on how to act as a responsible adult man and is a highly secretive practice, part of a sexual socialization process to regulate and endorse culturally accepted norms of heterosexual manhood. Thirdly, the intervention needs to be accepted by different groups and include as many as possible in high prevalent areas, and it has to be performed at an early age, before sexual début, to be effective. This includes acceptance of clinical circumcision as there is a tendency that men who are clinically circumcised are not perceived as real men as they lack the traditional ritual

schooling that will transform young boys into men. The risks for morbidity, mortality and severe physical complications are also very high when undertaken as part of traditional rites of passage. It has been stressed that the previously documented positive outcomes of circumcision do not take into account underlying cultural meanings, suggesting that circumcision has implications for how young boys construct their masculine sexual identity and can promote early sexual debut, pushing for the onset of sexual activities as well as the possibility of an increased risk for HIV infection, morbidity and mortality in relation to traditional circumcision [41, 104, 105]. Fourthly, it has to be undertaken in a safe manner in order to minimize severe side effects. Clinically undertaken, male circumcision rarely has any severe complications, which is not the case in traditionally performed circumcision, where both mutilation and death has been documented [106] as well as degrading and violent treatment of young boys, implicating further health hazards [105].

To enter this field, good contextual knowledge is needed as the intervention is not just about the removal of the foreskin, but falls into deeply rooted normative and traditional systems, where male circumcision carries strong symbolic values. However, the representation of a man and associated attributes have evolved and been re-shaped into new sets of meanings, where traditional social expectations of responsible and restrained sexuality have largely changed. For example, most men of Xhosa origin are sexually socialised via initiation schools, which is of paramount importance in the community and for the individual. Historically, sexual socialisation during initiation used to involve physical testing, seclusion, metaphorical death and rebirth, and masculine fitness. Sexual instruction and guidance concerning married life commonly formed a part of the training during male initiation [105]. The emphasis in recent years on circumcision has not stressed potential implications for how young boys construct their sexual identity, where circumcision can promote early sexual debut with the possibility of negative health consequences [41]. More research on the associations between male circumcision and other practices with symbolic value is thus needed to offset the possible negative sexual health outcomes of circumcision. The role of the so-called circumcision schools has changed, and new meanings attached to the rituals have been introduced, resulting in a breakdown of young males' sexual socialization [105]. This is even more evident in urban environments that have seen dramatic changes to many traditional mores for sexual socialization, such as the rite of passage that transforms boys into men, that today are fragmented or have disappeared altogether [107]. Traditional structures, such as initiation rituals that used to be central to the sexual socialization of boys into men should thus be revisited for their potential as an integrated part of HIV prevention. Previous research and designed interventions show weak support for the up-scaling of traditional male circumcision as a biomedical intervention [106], but that medical circumcision alongside traditional initiation could be promising [104].

Other types of biomedical interventions for HIV prevention

Other types of biomedical interventions that recently have been strongly argued for and addressed in research as well as in interventions include microbicides, treatment of other sexually transmitted infections (STIs) and HIV vaccines [108], and there are today a whole range of different methods suggested in the fight against HIV.

Microbicides

Microbicides provide a biomedical intervention that has been discussed widely in the last

decade as a potential preventive tool. Delivery of these can be through a range of chemical products such as gels, foams, films, creams or suppositories that can be inserted into the vagina or the rectum before sexual intercourse [108]. Microbiocides act by disrupting or disabling organisms or block their entry into host cells by interfering with cell surface receptors [109]. Most agents initially developed were non-specific and were aimed at disrupting viral and cellular membranes or creating a more hostile environment in the genital tract for viral transmissions [110]. More recent and better understanding of the pathophysiology of HIV sexual transmission has enabled the development of topical microbicides to prevent HIV [110]. Earlier attempts, as in the case of nonoxynol-9, showed an unexpectedly high frequency of vaginal lesions, with an increased risk of contracting sexually transmitted HIV, and the ongoing clinical Phase II trials had to be stopped prematurely [111, 112].

There are however no microbiocides on the market as yet and previous products tested in Phase III trials have been proven ineffective or even harmful [79, 108]. There are several Phase 1, 2 and 3 trials ongoing and several have recently been completed or halted because of disappointing findings. So even if an effective product is developed, there are still many years before it would reach the market.

It has been stressed that there is an urgent need for female-controlled methods for HIV prevention, and microbiocides have been in the forefront in this discussion. Their use has been viewed as a female empowerment tool which would allow women to be in control of their own sexual risk reduction strategies [109, 111, 112]. However, many researchers and advocates of microbiocides have a naïve and un-contextualised understanding of the preventive effectiveness of biomedical prevention, for example, the implications for the efficacy and effectiveness of microbiocides in cultures where dry sex is practiced. Little is understood about the inter- and intra personal psychological, socio-cultural and product related factors which can affect the acceptance and long-termed use of microbiocides [113]. Furthermore, as a strategy it ignores the construction of gender and other power mechanisms that influence calculated efficacy and there is little or no discussion about male and female sexual agency in relation to microbiocides. Unless it simply follows the presumption that men are perpetrators and women are victims.

Vaccines

Immunization is one of the most effective methods used for protecting the public against infectious disease [114]. However, there have been disappointing results in clinical trials for preventive vaccines as for many other biomedical interventions. Not a single candidate has yet been found to provide adequate protection against HIV infections in humans [115]. Most of the trials that have been undertaken for vaccine efficacy are currently in or have only reached Phases 1 and 2 and few have managed to reach Phase 3, which is when the vaccine is tested on a larger scale on human subjects [116]. A successful vaccine must be able to prevent infection or be able to sufficiently reduce the viral load in infected individuals to be effective as a preventive strategy. If a preventive vaccine was developed it is likely to be the most effective way to put a halt to the HIV epidemic. There are a great many obstacles to overcome before this is a reality.

One overarching obstacle is the amount of money invested into vaccine research. Large sums of money have already been allocated to vaccine development, but these are relatively small compared to investments into other strategies. HIV vaccine research is perceived as a financially high risk venture and is not attractive to private investors and profit-making firms [115]. Another key reason for difficulties in developing an effective vaccine is that HIV clades

are taxonomic sub-groups divided in geographical areas, with clades distinctively different from each other, thus contributing to the difficulty to develop an HIV vaccine [116, 117]. Furthermore, classic approaches to their development have not yielded a vaccine so far. New approaches are needed [118] to generate broadly reactive, neutralizing antibodies and cellular immune responses [119]. Further, the capability of HIV to rapidly mutate its envelop proteins and evade the host's immune system creates an enormous challenge to creating a vaccine [117]. Mutation of the virus has been considered one of the key problems, not only in relation to vaccine development, but also in rapid resistance development in ARV therapy. So even if a vaccine was developed with high efficacy it would take many years before it would reach the market and be accessible on a large enough scale to work as a preventive tool.

PEP and PrEP

Another biomedical prevention strategy that has been available for at least a decade is Post Exposure Prophylaxis (PEP). This is the use of anti-retroviral drugs after an actual or potential exposure to HIV [120]. Initially, PEP targeted occupational exposure to HIV, rape survivors and to reduce mother to child transmission [121]. PEP is a medical regimen where the patients are prescribed either a 2-drug or a 3-drug combination (recommended) for 28 days and as soon as possible after an HIV exposure [122, 123]. The time factor for initiation of PEP is crucial, and most guidelines recommend initiation no later than 72 hours after exposure to HIV. However, no evidence in humans indicates that treatment started after 48 hours is protective [124].

The PEP as a non-occupational intervention has been more debated, where people who have been exposed after, for example, risky sexual encounters can receive PEP for prevention purposes in order to avoid sero-conversion. Even though some stress the community effectiveness of PEP in resource constrained settings [125], others show high risks where levels of adherence to medical regimens are strikingly low. In a recent study of PEP for child rape survivors in South Africa, many did not adhere to the programme and its follow up procedures, showing a 64.5% drop out rate for the first three weeks of the programme. This was lower than other studies undertaken in Malawi, Kenya and Uganda which had a mean adherence rate of 55% [126]. A very low adherence among people exposed to PEP in low and middle income countries constitutes a potential high risk of resistance development to ART and reduced efficacy in prevention. This has however raised concerns on the grounds that it may undermine behavioural prevention strategies and increase risk taking [120]. Advocates of PEP have been overly optimistic as there is little data and support for the actual effectiveness of the strategy. Data supporting the efficacy of PEP come largely from a small number of older studies and case reports and studies on mother to child transmission. Research has so far been limited because randomized control trials would be unethical and existing evidence is based on small sample sizes [124].

Pre-Exposure Prophylaxis (PrEP), an experimental HIV prevention strategy currently being evaluated in clinical trials, has been seen as an additional preventive tool to reduce transmission among high risk individuals. PrEP refers to HIV-negative individuals initiating ART before or during periods of HIV exposure in an attempt to prevent infection [122]. Initially this was modelled after maternal-infant prevention to reduce the risk of infecting the child of HIV-positive mothers, by administering HIV-specific treatment drugs to HIV-negative individuals who may be at risk of exposure [121]. However, little research has been undertaken so far and the strategy thus lacks evidence of its efficacy [127]. Even though the efficacy of PrEP is proven to be high, it is essential to establish evidence of community effectiveness and exactly how people use PrEP as a strategy. Many have expressed concern that it could stimulate high risk sexual behaviours as well as the risks of potential antiviral resistance.

Antiretroviral Therapy and sexual risk behaviours

1996 can be considered a milestone in the history of HIV, when the first triple combination of Antiretroviral Therapy (ART) was introduced as a biomedical intervention against AIDS [128]. In the beginning access to ART was only available for HIV-positive people in high-income countries (HIC) due to constrained resources. HIC are also where most research had been undertaken to get a better understanding of ART and to map out sexual behaviours. However, ART has become more widely accessible in low-income settings in recent years, but research on ART in relation to sexual behaviours and factors that fuel the epidemic in those contexts is just in its infancy [129, 130]. A relatively recent review by Elford, [131] shows both increases and decreases in sexual risk behaviours after the introduction of ART. Studies in the US and Europe indicate that overly optimistic attitudes about HIV treatment among several defined subgroups with risk behaviour has led to a reduced concern of being infected [43, 131-133]. Furthermore, a recent study based on multivariate analysis of the relationship between ART, adherence and unprotected sex suggests that a decrease in sexual risk behaviours is dependent on levels of adherence among clinically enrolled patients [134].

Much is still unknown about the impact of ART on transmission and a better in-depth understanding of factors that affect interventions, such as for example, the age and gender taxonomy in sexual encounters, needs to be further researched for future interventions [135-138]. To date there is little research on sexual behaviours in relation to ART and adherence in low-income settings in Africa, but several studies are currently being undertaken. One quantitative study in Uganda [139], showed that provision of ART, prevention counselling and partner VCT (Voluntary Counselling and Testing) in combination, was associated with reduced sexual risk behaviour and an estimated decreased risk of sexually transmitted HIV among adults. However, this intervention provided both prevention counselling and partner VCT in conjunction with ART, and so was heavily dependent on skilled human resources, something which is normally lacking in many low income settings. The inability to adhere to therapy is strongly associated with persistent shedding of HIV RNA in semen and genital fluids. Patients taking triple drug ARV regimens are less likely to be persistent shedders than those taking 2-drug regimens [140] that previously were widely used in many low-income countries. Another issue that has been discussed lately is superinfections and recombinant viruses in treatment-experienced patients and if these could have serious consequences for subsequent treatment [45, 141]. Acquired drug resistance may be transmitted both to HIV-negative treatment-naïve patients as well as to treatment-experienced patients and it is well established that superinfection with drug resistant HIV-1 occurs in humans as well as an expansion of recombinant viruses, making currently affordable HIV drugs inefficient. However little data on the clinical implications of superinfections are available and there is almost no data on re-infection and related links to sexual behaviours [45, 142]. The hopes for ART are high and it has even been predicted that a reduction in viral load in treated individuals following early HIV diagnosis and initiation of ART would limit sexually transmitted HIV and reduce the incidence of new infections [43, 77, 143].

It is important to understand that medical regimens for HIV can only provide life long treatment and prolong the life years of an individual. HIV is a lentivirus, with the unique characteristics of long incubation periods and is thus slow in the development of specific symptoms, meaning that people can be unknowingly infected for many years. In many low-income settings, people get to know their HIV status at a very late stage of the disease progression and thus, an over-emphasis on ART as a preventive tool might be too restrictive to be effective. It is evident that the availability of ART caused a shift in focus, where prevention

efforts became slightly marginalised and were not developed or emphasised at the same pace as the treatment efforts [2]. This systematic imbalance in clinical and public-health programmes has recently been viewed as partly responsible for the large amount of new HIV infection every year [144]. The increased economic support in recent years has predominantly targeted the roll out and scale up of ART, and prevention has been given neither full attention, nor a fair share of allocated funding to match treatment efforts. A lack of interest in social sciences has been shown by some international organisations who have put themselves at the forefront of advocacy in favour of these new medical preventive methods. If research findings and knowledge about social and contextual dimensions of behaviour are not actively incorporated, this can put large scale implementations at risk of failure, [3]. However, there has lately been a re-emphasis on prevention as it is considered more cost-effective and must be promoted to match medical interventions [145]. At the AIDS conference in Vienna, July 2010, the issue of ART and treatment as prevention was widely debated. The development of treatment 2.0 is broad and aims at (hypothetically) saving 10 million lives using a broader platform for ART. The strategy is based on five different pillars to strengthen a serious medical approach. The five pillars include: creating a better pill and diagnostics; treatment as prevention; stop cost being an obstacle; improve uptake of HIV testing; and linkage to care and strengthening community mobilization [146]. Although the new strategy aims at broader and more full-fledged programmed designs, the same problems for implementation of treatment 2.0 remain.

HIV interventions – from individual towards structural approaches

Almost all attempts to develop preventive interventions have been inspired by European or American approaches, often with religious or moral messages. Most programs have prioritised individualistic, biomedical and behavioural perspectives and intended to influence individual-level behavioural interventions, targeting knowledge, attitude and practices among defined populations [13, 144, 147]. This is despite the domination of proximal determinants in the behavioural change process. Furthermore, it has been assumed in individual-focused approaches that the relationship between individuals and society is that the individual has the autonomy to make and act on his/her own choices. Little consideration has been given to individual agency that is constrained or shaped by structures in the social context [148]. Different theoretical models have been used, but contemporary models on behaviour change are largely built on different social cognitive/learning theories with considerable overlaps [84, 149, 150].

Social contexts, knowledge about people's understanding and interpretation of HIV and AIDS, insights into the competing interpretations of the disease that impact both positively and negatively on HIV intervention efforts are scarce, and largely ignored in health behaviour research and interventions [149]. Many of the HIV interventions seem to have been largely inadequate, meaning they have been ineffective in curbing HIV incidence and they have not been as cost-effective in the Sub-Saharan African context as anticipated [13, 74, 151, 152]. It has been strongly argued that the epidemic needs to be confronted with more innovative interventions based on a more thorough understanding of the contexts in which it appears to be flourishing [153, 154]. Although most interventions still target cognitive and individual levels, assuming that people have both the motivation and the freedom to adopt protective actions [84], there is now an emphasis on interventions needing to be informed by an understanding of the wider social context including support structures that can help endorse individual actions [41].

In understanding sexual risk behaviours, the interactive effects at three different levels are often stressed: Firstly, personal factors, that is cognition and feelings about sexual behaviours

and HIV, self-esteem, and self-efficacy. Secondly, proximal factors deal with interpersonal relationships and an individuals' physical environment. Thirdly, structural factors such as traditions, norms, shared beliefs and values and variations between sub-groups as well as the legal, political, economical, organizational and other socio-demographic elements of the society. These levels work interchangeably but there has been a tendency to overlook the structural levels and links to proximal and personal factors in program design where individualistic approaches for behaviour change appeal habitually [41].

Figure 1. Conceptual framework for preventive interventions

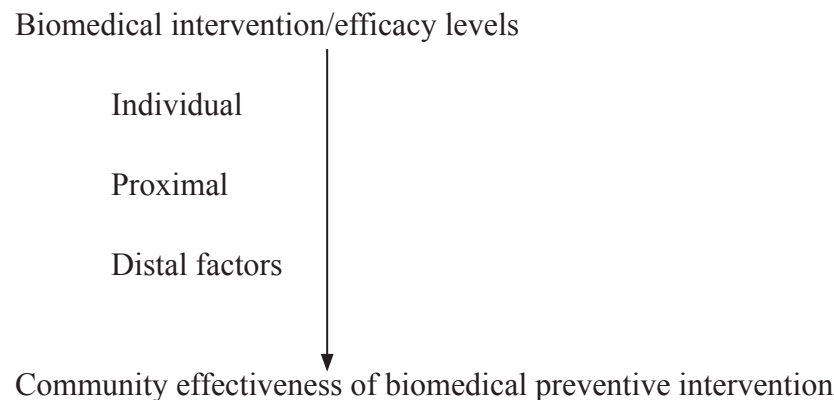


Figure 1 shows a conceptual framework where different levels to be considered in prevention efforts in biomedical interventions to ensure the efficacy transfers into community effectiveness

Behaviour change in populations is key to reducing prevalence, but it requires large numbers of people taking on substantial risk reduction strategies as well as maintaining these changes for a long time [84]. However, many studies following behaviour change interventions, often target knowledge, attitude and practice (KAP) and experience problems in maintaining set goals or knowledge levels. In a review of school based interventions, it was shown that changes were statistically significant only in the immediate post-follow up, and wore off in the following weeks and months [86]. This is pertinent for the overall behaviour change process, where mechanisms for intervention sustainability must be present for its effectiveness and ability to change the course of the epidemic in the future.

Many simplistic “Dos and Don’ts” messages that have been used in preventive design to reduce HIV transmission have also missed the target. Safe sex messages require some understanding of the biological principles of disease transmission [38]. Previous research has had a focus on HIV and AIDS, excluding for example the construction of sexuality and STIs and thus missing the contradictions and complexities that emerge when exploring people’s construction of illness and health [155]. The analysis of underlying and entrenched belief systems that influence the way people interpret STI/HIV/AIDS, sexual risk reduction, and stigma, as well as the social environments where interventions can be carried out, have often been reported as weak and insufficient [59, 156, 157]. The result is that many interventions that are informed by foreign interpretations of illness do not reflect local understandings. These interventions may therefore fail to address core issues that affect the wellbeing of people. Indigenous views of illness often demonstrate coherent patterns where causation, prevention and treatment are related to one another in functional ways, and where the representation of illness is firmly grounded in culture and socialization [156, 158].

Structural interventions

Moving away from the focus on individualistic approaches has been labelled ‘structural interventions’. Structural interventions differ from traditional public health interventions as they locate the cause of public health problems in contextual or environmental factors that influence risk behaviours, or other determinants of infection or morbidity, rather than in the characteristics of the individual [148]. Structural interventions can then include actions implemented as policies or programmes that aim to change the conditions in which people live [147]. It has further been shown that successful individually-oriented interventions are substantially improved when HIV prevention addresses the broader structural factors that shape or constrain individual behaviour as well as acting as barriers to individually-oriented HIV preventions and care services [147]. Therefore, successful prevention requires knowledge of the country-specific nature of the epidemic as well as the community context, including the socioeconomic and cultural factors such as poverty, gender, human rights, politics and religions, that affect the spread of the virus [2]. By using the term structural factors, we refer to and define it as the physical, social, cultural, organisational, community, economic, legal and policy aspects of the environment that impede or facilitate a person’s effort to avoid HIV infection. This locates the source of public health problems in factors that shape and constrain individual, community and societal health outcomes [147, 159-161].

Structural approaches however do not work the same way or have the same effect in all settings and thus need to be contextually analysed and adapted to the population being served [147]. Recent studies have demonstrated the usefulness of adding cultural orientation when predicting health behaviour as the HIV epidemic needs to be tackled through more innovative intervention approaches [153, 154]. This is especially important when addressing structural factors that affect sexual relationships and the transmission of HIV. Individual autonomy is by no means a culture-free entity and the mode of transmission has to be understood within existing explanatory systems, particular in terms of associated images, symbols and representations [52]. The way in which individuals respond to key messages about sexual risk reduction is related to contextual support and structures at all levels, where socio-economic conditions are equally important to understand how behaviour is shaped and influenced [162].

Blankenship et al identify three different levels in the design of structural interventions:

- 1) *Availability interventions* - where people are often restricted via laws, taxation, distribution of support or hindering mechanisms or criminalisation.
- 2) *Acceptability interventions* - where normative structures in public health problems are located and manipulated to affect public health.
- 3) *Accessibility interventions* – have a focus on the unequal distribution of resources and power and interventions that try to compensate for or re-balance defined inequalities in the social context [161]. These different levels work interchangeably, but it is important to note that single prevention strategies are often insufficient and a combination of strategies are needed, including biomedical, behaviour and structural intervention efforts [144]. By combining or using different strategies some synergistic effects can be achieved that can elevate the predicted health outcomes. Even though several structural interventions have proven to be successful in other public health concerns, there are obviously great challenges when it comes to HIV and sexuality. There might be other mechanisms and interests in maintaining specific behaviours such as for commercial sex workers, or limited/unequal power in relationships or ethical dilemmas when it comes to human right issues and planned interventions. Another key problem regarding people’s sexuality is that it is viewed as private, often surrounded by secrecy and taboos, and thus not to be dealt with openly in the public sphere. Therefore, an understanding of people’s social and sexual interaction in relation to the risk for transmission is important to curb the incidence.

OBJECTIVES

General objective

To explore male sexual risk behaviours and sexual risk reduction strategies among males in urban resource-poor settings in sub-Saharan Africa with implications for sexually transmitted HIV and prevention strategies.

Specific objectives

1. To understand social and sexual networks among males in urban townships, with high risk sexual behaviours
2. To describe and explore promoting factors for high risk sexual behaviours among males in urban townships
3. To explore factors that support or hinder risk reduction of HIV transmission among male ART patients in an urban, high risk environment
4. To analyze factors associated with sexual risk behaviours among men and women living with HIV, enrolled in an urban ART programme

MATERIAL AND METHODS

Research settings

The data described in the five papers in this thesis was collected through three different sub-studies performed in Khayelitsha/Cape Town in South Africa and Kibera/Nairobi in Kenya. Both these settings are large in size and defined as urban informal or partly informal settlements, which have evolved due to the rapid and uncontrolled in-migration to small geographical pockets within or outside the Central Business District (CBD). Population density is very high with many similarities between the settings, but also with large variations due to the historical, political and economical situations of the respective countries. However, both are considered to be amongst the largest informal settlements in Africa, lacking a sufficient infrastructure to serve the population needs for water, sanitation and housing as well as for education and healthcare. Data and information about these settings are often inaccurate due to the informal status of the settlement combined with a rapid population turnover that renders documentation outdated relatively fast.

Table 1. Socio-demographic and health indicators for Kenya and South Africa

Total population	36,553,000	48,282,000
Gross national income per capita (\$)	1,470	8,900
Population urbanized**	22	61
Life expectancy at birth m/f (years)	52/55	50/53
Probability of dying under five (per 1 000 live births)	121	69
Total expenditure on health per capita (\$ 2006)	105	869
HIV prevalence*	7.1 - 8.3	15.4 - 20.9
HIV prevalence rural/urban	5.6/10.0	9.4/10.6
People on ART	177 000	460 000
Total fertility rate	5.0	2.7

Source: WHO (unless otherwise stated)

* UNAIDS

** UNICEF

Khayelitsha

Sub-study 1 was undertaken at Khayelitsha (meaning ‘new home’), which is one of the largest townships in South Africa with an estimated population of approximately 500.000 inhabitants. This was the first illegal settlement in the Apartheid era and during the 1970s and early 1980s people, mostly men, started to populate the area. The townships were merely set up as dormitories for the black male workforce. After the scrapping of pass laws in 1987, many IsiXhosas, predominantly from the Eastern Cape, moved into areas around Cape Town in search of work. The in-migration has taken place mostly in the last twenty years and many in the younger generation have been born in the township, although they still uphold strong bonds to

their rural areas. The township is today a permanent fixture with a mix of formal and informal, affluent and poor. The physical infrastructure provides shopping centres, clinics, fire stations, schools, police stations, recreation centres, churches and post offices.

Most people have electricity and access to fresh water and toilets, but still live in what are referred to as backyard shacks. Among those infected, the highest HIV prevalence is found in urban informal localities (17.6%), compared to urban formal (9.1%), rural formal (9.9%) and rural informal (11.6%) localities [163]. Further, the townships are also characterized by economic hardship and rapid societal changes that put men (and women) at increased risk of poor health outcomes [70, 164]. In addition, domestic violence, sexual assault and rape in South Africa, particularly in informal urban settings, is alarmingly high suggesting problematic gender dynamics [41, 57-62]. The population is very young and it is estimated that 76% are less than 29 years of age, meaning that most people residing here are of reproductive age. The growth rate between 1996 and 2001 was estimated to be 5.3%. The general educational background is low, where 76% of the inhabitants were below upper secondary school certificate level and more than half (51%) were reported in the 2001 census as being unemployed [165]

Kibera

Kibera informal settlement is located southwest of Nairobi city centre and originates as far back as the beginning of the 19th century when it was first populated by Nubian soldiers. It is a small area geographically, approximately 2.5 square kilometres, and with an estimated population of anything between 600,000 and 1.2 million. However, there are no reliable statistics on how many people actually live in Kibera and due to the massive in and out-migration to the area, estimates vary to a large degree. But it is said that Kibera might hold more than a quarter of Nairobi's population. Today, Kibera is a permanent fixture of informal dwellings, where most people live under very deprived conditions with very limited access to basic services. The high population turnover has profound implications for reduced social cohesion. As an unregulated informal settlement, the area displays many of the characteristics associated with large slum areas. Most people live in mud-walled houses with iron sheeting, more than 80% live in single rooms and the average family size is four [166]. The tribal composition is diverse, but among the patients at the AMREF clinic, Lou, Kamba, Luhya were the predominant ethnic groups and most people identify themselves as Christian (91%). Compared with city residents in formal settings, people in settlements like Kibera have their sexual debut earlier, have more sexual partners, are more likely to use alcohol and are less likely to adopt preventive measures against contracting or transmitting HIV [167]. Socio-demographic analysis of the sample population visiting the clinic showed that tribal backgrounds were very diverse and representative of the ethnic diversity in Kibera.

Most patients had lived in the Kibera informal settlement for more than five years (71%). The majority of patients had known their HIV status for more than one year (73%) and had received ART for more than one year (53%). The educational levels of the patients were relatively high; half of them had completed primary school (51%), and many had finished secondary school or even been to college (42%). Many people were unemployed (45%) with an income level of below 10,000 Kenya shillings (approximately 140 USD) a month. Inconsistent condom use was reported by 28% while relatively few reported having two or more sexual partners (9.5%) in the previous six months. Many of Kibera's inhabitants are moving into the slum from up-country due to problems of rural underdevelopment. However, the attraction of the big city and dreams of a new and better life often turn into another kind of reality where people are facing hardship and difficulties surviving in this harsh environment. This is not least evident when it comes to

violence. The multi-ethnic nature coupled with the tribalism of Kenyan politics has led Kibera to be the site of small ethnic conflicts throughout its near 100 year history. This took a new turn in December 2007 when fights started between ethnic groups in relation to the elections.



Picture 1. Kibera informal settlement

Data collection

The thesis consists of three different sub-studies. Sub-study 1, in-depth interviews with 20 sexually active men reporting risk behaviour, was undertaken in Khayelitsha. This study generated a lot of data and therefore a total of three publications were generated from this study (Papers I-III). In Sub-study 2 a total of 20 in-depth interviews with male ART patients visiting the African Medical and Research Foundation (AMREF) were undertaken in Kibera (Paper IV). Sub-study three, a quantitative cross-sectional study of sexual risk behaviour among men and women on ART was performed at the AMREF clinic in Kibera (Paper V).

Situational analysis

The three sub-studies were based on a thorough situational analysis [168] to help the research team identify gaps in knowledge and define key objectives to be addressed. For Sub-study 1, the situation analysis formed part of a longer process where different sources were used. As this study was designed back-to-back with a quantitative survey, the collaborating research team at the Medical Research Council (MRC) had previously identified key issues of interest and gaps in knowledge that needed to be addressed via qualitative research. Furthermore, I

had previously conducted research in South Africa producing several publications for which a review of literature had been undertaken, and this informed Sub-study 1 on weaknesses in the existing data, which were outdated, imprecise or incomplete. For Sub-studies 2 and 3, different information sources were used during the situational analysis. Firstly, secondary data, that is existing and available data were reviewed and analysed. This included demographic information, ART guidelines and patient records and record keeping procedures to provide information for primary data collection. Furthermore, information from what is called grey literature, that is unpublished material from organisations, was scrutinized to get a better understanding of the context and the topics of interest. This process ensures the utilisation of already available information, as well as identifying weaknesses in the existing data, which may be outdated, imprecise or incomplete. Secondly, primary data based on interviews with staff members and organisations to further define core problems, were undertaken. This also allowed the research team to assess the structure of the ART programme and determine what was needed to be able to carry out research within such a programme.

Sampling and recruitment of participants

In Sub-study 1 (Papers I-III), a total of 20 in-depth interviews were undertaken every third weekend over a period of three months in 2006. The inclusion criteria were men older than 18 years, who had had more than 1 female sexual partner in the past 3 months, where at least one of these sexual partners was younger than 24 years, or more than 3 years younger than the participant. The reason for the inclusion criteria was that it was developed in conjunction with a larger survey based on respondent driven sampling (RDS). The additional qualitative component, Sub-study I, aimed at an in-depth understanding of men and their self-ascribed (sexual) identity, norms and sexual networks and thus, interviewees were identified from the pool of individuals recruited in the quantitative study. Furthermore, RDS is a sampling procedure which aims specifically at reaching members of hard-to-reach and hidden populations [169-171]. In Sub-study 1, men were purposively sampled among men attending the quantitative study. In purposive sampling, we sample with a purpose in mind and target a particular group of people. When the desired population for the study is rare or very difficult to locate and recruit for a study, purposive sampling may be the only option. Furthermore, purposive sampling can be very useful for situations where you need to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. With a purposive sample, you are likely to get the opinions of your target population, but you are also likely to overweight subgroups in your population that are more readily accessible. This was especially important in Sub-study I (Papers I, II, III), where hard-to-reach males were targeted, not associated with any defined organisations or structures, but rather with drinking venues. All sub-studies were undertaken in high-risk settings, which affect the data collection. For Sub-study 1, the research team tried initially to undertake the research during the course of the week, but this had to change due to minimal response to participate. By relocating the interviews to the weekends, men were more willing to participate in both the qualitative as well as the quantitative component. Several men were denied participation due to influence of alcohol and/or drugs, and due to this, interviews were conducted in the mornings at the local hospital in Section B in Khayelitsha in one of the consultancy rooms. For Sub-studies 2-3, this was undertaken in a similar high risk environment, where both violence as well as riots during the political turbulence in 2007, naturally had to be considered for security reasons.

Sub-study 2, (Paper IV), recruited 20 male patients coming for treatment follow up at the community-based health clinic providing ART in Kibera run by (AMREF) to take part in an in-

depth interview. Inclusion criteria were men over 18 years of age, receiving free ART from the AMREF clinic and residing in Kibera. Between May and July 2007, male patients were recruited by a research assistant who asked male patients to participate in the in-depth interviews. Patients were purposively selected to reach a wider range of patients, but the samples were men mostly over the age of 30, as rather few younger men within the age range of the inclusion are actually enrolled into the ART programme. We aimed at locating an age disparity among this particular group of male patients and thus purposively looked for younger male patients coming for treatment follow-up as they were rare or very difficult to locate and recruit for a study. All interviews were undertaken in one of the consultancy rooms at the clinic.

The cross-sectional survey in Sub-study 3 (Paper V) was conducted among HIV infected patients attending the same clinic as those included in Sub-study 2. During the period September 2007 - April 2009, all male and female patients above 18 years of age were eligible to participate in the study and were recruited consecutively at the AMREF clinic during their visits for treatment follow-up. A trained research assistant working at the clinic asked patients to be part of the study. A total of 515 patients (348 women and 167 men) consented to participate and provided complete data. None of the patients refused participation in the study.

In-depth interviews (Sub-studies I and II)

Qualitative interviews were used to generate in-depth accounts from individuals for exploration of specific issues. The technique aims at generating a comprehensive understanding of the context and to allow an inductive process where underlying structures and meaning can emerge [172]. In-depth interviews were used as the sole data source organised around a set of predetermined questions, which is commonly the case for individual in-depth interviews [173]. A thematic question guide (TQG) with open-ended questions addressing specific thematic areas was used for in-depth interviews and primary data collection. The TQG helped facilitate the work in planning, collecting and managing the data and in preparing a feasible structure and target core issues to help the researchers to freely explore, probe, and ask questions that would elucidate and illuminate that particular topic. Each theme contained several underlying questions allowing the researchers to word questions spontaneously, but with the predetermined subject in mind. The two sub-studies had different aims and thus the themes and TQG were different (Appendix I and II).

All interviews in Sub-studies 1 and 2 were conducted by Anders Ragnarsson. Except for one interview in Sub-study 1, which was undertaken exclusively in English, a trained interpreter was present during the interviews and translated the conversations into English and/or isiXhosa (Sub-study 1) and English and/or Kiswahili (Sub-study 2) when necessary as most participants partly understood English. Interviews were held at the hospital in Khayelitsha (Sub-study 1) in one of the consultancy rooms at the emergency wards and in Sub-study 2, a consultancy room at the AMREF clinic was used. All in-depth interviews were audiotaped and took approximately one and half hours to conduct. All interviews were translated by a research assistant fluent in both languages and transcribed into English and double checked by another independent research assistant for accuracy and quality. Following the interviews, the content was discussed with the interpreter, who also worked as an informant to further help interpret and contextualise the data. This was followed by discussions with the research team to further validate the data and define themes that occurred.

Cross-sectional survey on men and women on ART (Paper V)

Sub-study 3 is based on a cross-sectional survey that was part of a cohort study on ART adherence. Data collection was carried out between September 2007 and April 2009. All patients, both men and women, over 18 years of age were eligible and were asked to participate in an anonymous, interviewer-administered study at AMREF's ART program in the Kibera informal settlement. The interviews took approximately 30-45 minutes to conduct. Patients were asked to complete a questionnaire containing socio-demographic data including information on age, gender, ethnicity, religion, civil status including number of children, educational level, income, work status, living arrangements, alcohol and other drug consumption, disclosure of HIV status, access to social support and adherence to ART. Furthermore, specific questions on sexual activity during the last six months, number of sexual partners, libido, sexual debut and sexual risk reduction strategies were included (See Appendix III). The questionnaire was translated into Kiswahili and back translated into English several times to ensure correctness of the content. After the questionnaire had been filled in by the research assistant, who consecutively recruited patients coming for follow-up at the clinic, the data was entered in a data base (SPSS 17) by the responsible person at the clinic and was randomly double checked for validity by the researcher in charge at the clinic.

Analysis

Qualitative analysis (Sub-studies 1+ 2)

In Sub-studies I – II, we applied latent qualitative content analysis. It needs to be stressed that a content analysis can be quantitative, as is often used in media/communication research, or it can be qualitative, which has been a dominant form within nursing and educational science. Furthermore, latent content analysis works inductively, trying to explore and elucidate information given in in-depth interviews and thus involves relationship aspects and an interpretation of the underlying meaning of the text (transcripts) [174]. Inductive content analysis is recommended when there are no previous studies dealing with the phenomenon, or when knowledge is fragmented [175]. By doing an inductive content analysis, the transcriptions are read several times to identify headings to describe aspects of the content followed by open coding and then put into categories to be able to collapse those that are similar and dissimilar into broader higher order categories [175]. In this process, meaning units are identified and words and statements are grouped together in the coding, followed by condensation of meaning and abstraction, describing an interpretation on a higher logical level [174]. The analysis is also part of the post-interview phase, which also demands skills to capture the explicit and implicit expressions of the respondents, and where the timing of translation and sequencing of data management are most important in cultural competence [176]. The trustworthiness of research findings is pertinent and includes the credibility, which refers to how well data and processes of analysis address the intent focus of the study, which includes aims, selection of the context and participants as well as choice of method for data collection. In this process, the inclusion of various perspectives is important as well as the amount of data, which will enrich the data [174]. It is also important to test the validity of data. In qualitative in-depth interviews, data is normally generated until saturation of information is met. In Sub-study 1 and 2, interviews provided the team with enough data to meet this criterion. Furthermore, in the analysis process, informants, research team and clinical staff discussed different themes, codes and meaning units to validate the data as an ongoing process.

Quantitative analysis sub-study 3 (paper 5)

SPSS for Windows (version 17.0) was used for statistical analysis. Data were routinely collected at the AMREF clinic by the research assistant and entered consecutively into an SPSS data entry programme. Descriptive statistics were performed on socio-demographic characteristics and the outcome variables. Sexual behaviour related outcomes were categorised and coded as follows: consistent condom use (yes="always", no="never or sometimes condom use"); number of sexual partners in the previous six months (zero or one sexual partner in the previous six months vs. two or more sexual partners). Mean and standard deviations were computed for numerical variables and proportions for categorical variables. Following the descriptive analysis, we performed bivariate and multivariate logistic regression models to assess the association between explanatory variables and the outcomes of consistent condom use and a dichotomized number of sexual partners in the previous six months. The explanatory variables included in the bivariate analysis were: sex, age groups ("18-30", "31-40", "41-50", "51-70"); education ("never been to school", "primary school", "secondary school or more"); employment ("unemployed", "employed", "casual labour"); marital status ("married", "unmarried"); income per month ("less than 5000 Kenya shillings", "more than 5000 Kenya shillings", "uncertain"); alcohol use ("high consumption", "normal or low consumption"); time on ART in months ("1-6", "7-12", "13-18", "19-24", ">24"), disclosed HIV status ("Yes", "No"). Independent variables significant in bivariate analysis at a level of $p < 0.20$ were included in the model and removed using a forward stepwise method (Likelihood Ratio Test with a removal level of significance of $p < 0.1$ was applied). Odds ratios (ORs) and their 95% confidence intervals (CIs) were also computed. A value of $p < 0.05$ was considered statistically significant and tests of significance were two-sided. Hosmer-Lemeshow tests were computed to test the final models' goodness of fit and we found that the consistent condom use model and the multiple partner model adequately fitted the data.

Ethical considerations and research permission

Research involving human subjects demands respect for the person who is to participate voluntarily understanding adequate information to make an informed decision. Furthermore, people enrolled should be treated in an ethical manner not only by respecting their decisions and protecting them from harm, but also by making efforts to secure their well-being. This is especially important when targeting issues such as sexuality, which for many people is of a sensitive nature. Application of the general principles for the conduct of research leads to consideration of the following requirements: informed consent, risk/benefit assessment, and the selection of subjects for research. Assessments of risks and benefits were undertaken and followed the strict criteria reflected in the research design. For all sub-studies, informed consent was given both verbally and in writing. All study participants were assured that their anonymity would be strictly upheld throughout and after the study period. It was stressed that participation in the studies was voluntary, and participants could withdraw at any time with no effect on them, their family or on the care and treatment given. Because the subject's ability to understand is a function of intelligence, rationality, maturity and language, it was necessary to adapt the presentation of the information to the subject's capacities. Investigators and research assistants were responsible for ascertaining that the subjects had comprehended the information.

The Human Research Ethics Committees of South Africa and Kenya approved all the studies.

Study I: Approval from Health Sciences Faculty Research Ethics Committee (REC REF: 260/2006)

Studies II+III: Approval from The Kenya Medical Research Institute (KEMRI), the Ethical Review Committee of which is the committee accepted by the Ministry of Health as a National Ethical Review Committee (KEMRI/RES/7/3/1).

Permission was also received from the District Medical Officer of Health, Langata district and the Regional Ethical Review Board in Stockholm/Karolinska Institutet (2010/647-31/3).

MAIN FINDINGS

The construction of concurrent sexual relationships (Paper I)

The increased risk for sexually transmitted HIV from concurrent sexual relations is well established, and operates as an important factor in the epidemiological development of HIV. The structure of the sexual networks described by the men was very similar (Paper I). Sexual relationships were divided into three distinctly different types of relationships forming a hierarchical structure. In this structure, one official (to whom they were married or not) woman was identified as the main partner and was often referred to as the “bankbook”. Because of the proximity, this category of women had more of a socially and economically interdependent relationship with the men (hence the term ‘bankbook’) compared to other female sexual partners in the network. As the main partner they automatically became part of a concurrent sexual network, knowingly or unknowingly, and were thus exposed to potential risk of HIV infections (However, it has to be stressed that these male sexual networks are also mirrored in female sexual networks, which further exacerbates the size of these networks as well as the potential risks for sexually transmitted HIV). Besides the main female partner, an average of three to six concurrent girlfriends were defined as part of the network, often geographically spread over a larger area, and entailing regular sexual encounters. These women were perceived as steady partners and could be short term, for some months only, or forming long term relationships extended over years. In addition to the permanent partner and girlfriends, a third category of clearly defined sexual partners were revealed. These women were temporary weekend relationships, lasting for some hours or one night only, but still often viewed as a loving and affectionate relationship during that time. These ‘getaways’ were something that happened almost every weekend and often entailed two to four sexual encounters with different women after heavy binge drinking at shebeens - which also correlates strongly with sexual disinhibition and low or incorrect condom use as shown in Paper III. This means that many unsafe sexual encounters takes place during the weekends forming an entry point into the sexual network and the potential for the rapid spread of HIV due to high virulence in the initial phase of the infection. Although these temporary sexual encounters do not endure over time, they are nonetheless part of concurrent relationships and have the potential of high HIV transmission within and between other sexual networks.

Men’s self-defined sexual networks were therefore, very large in size and in connectivity with many identified sexual events taking place (figure). The high risk nature of concurrent sexual networks as outlined in the introduction is not alone as a factor, but it carries several associated risks such as biological factors and further exacerbates the risk of new infections as well as for the epidemic at large. Furthermore, these networks were geographically large, reaching deep into different factions of urban informal and formal settlements, but also into rural settlements as many men maintain or partly maintain, close contact with their place of origin. Mobility is an important factor in maintaining both concurrent girlfriends and temporary sexual relations; to strategically spread the network minimizes the risk of being caught by their

main partners. Many men deliberately travelled to neighbouring areas for their temporary sexual encounters in order to escape social control by their main partners and/or other girlfriends.

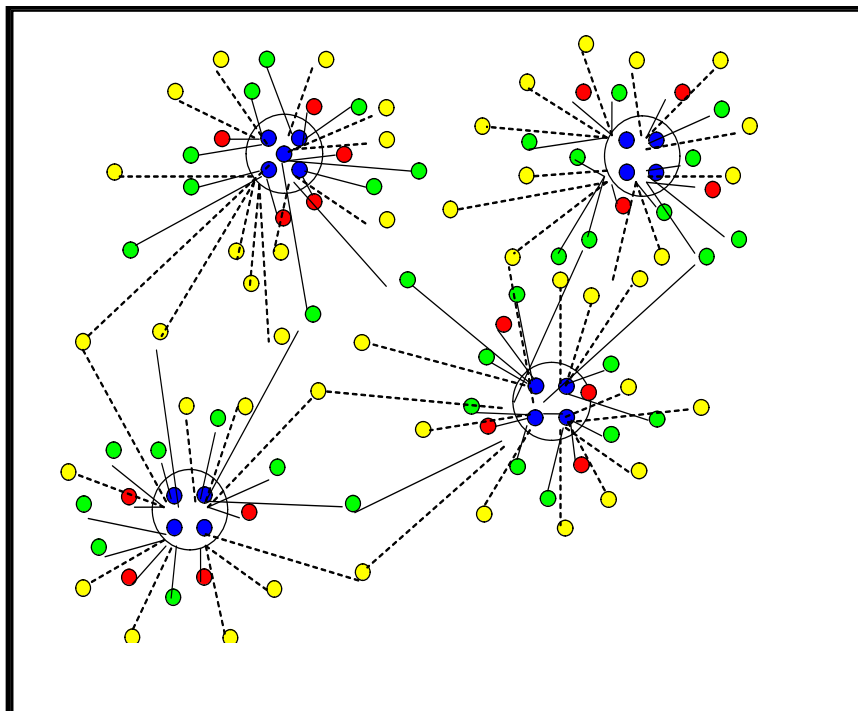


Figure 2. A model of the size and connectivity in sexual networks which visualizes the potential for rapid spread of sexually transmitted HIV if the virus enters the network and thus reaches several different factions socially as well as spatially. Blue=men, red=main partner, green=concurrent girlfriends, yellow=weekend girlfriends.

In understanding the behaviours and factors associated with increased risk of sexually transmitted HIV, the internal and often well-defined structure of sexual networks provides important information. Sexual networks follow a system that is well grounded in the local context, which of course has an historical background based in structured labour migration, as well in traditions and norms. Thus they are a novel expression and reflection of underlying norms in society, including gender dynamics and power structures. On a proximal level, these girlfriends were important since they were key in providing a network of female friends for potential sexual encounters and new relationships for the other core group members, which also could entail transactional sexual components (elaborated in more detail in Section 5.3)

Players and male enclaves facilitating concurrent sexual networks (Papers I, II)

The existence of large sexual networks and concurrency would be difficult to formalise if there were no support for such structures and no means to facilitate and maintain their formation. The men interviewed used the term *player*, which represented a male ideal and is central to a hierarchical structure that seems to predominate in many urban environments. The description of a *player* was usually characterized by two interlinked symbols of status: wealth and women, both important in the make up of a hegemonic masculinity. Money was crucial and seemed to

override other status symbols such as education or societal position; material symbols such as cell phones, sunglasses, and trendy clothes were important to overtly portray economic status. Interlinked with visible attributes, material wealth also played an important role in men's strategies to access sexual networks and sexual partners, where a player was expected to show he could afford and handle several women at the same time. In this way, women were also identified as a significant visible attribute of the dominant masculine ideal. Having multiple, and often very young, female sexual partners, further enhanced men's social position, where women served as a marker of both sexual and financial power. Seemingly, women responded to these strategies and helped in the creation of sexual networks as well as in the socialization of men's sexuality. This means that men and women are part of a process where social identities are contextually supported and where engendered dynamics create high risk environments for potential HIV transmission.

Furthermore, the strong peer pressure within male social groups to have many concurrent, young sexual partners played an important part in the creation of the masculine ideal, manifested in large sexual networks. Within peer groups, the pressure to live up to set norms further reinforced the meaning and status of the player. If a man adopted an alternative form of masculine ideal, the fear of being emasculated and thought not to have what it takes to be a real man according to norms in this specific context and group of men, was prevalent. The attributes suggested for a successful man also indicate that the representations of a man, like the player, exist and are integrated into a new urban form of masculinity. In addition, there were also strong links among the players to violence and crime, both highly prevalent in the area. They were often referred to as a way to achieve money, power and status and were thus part of the player concept developed in the townships. Violent men, called gangsters, were easily identified and depicted as economically stable, successful and popular among women, and thus part of the representation of this form of hegemonic masculinity.

For these men, the player was a way to depict prevailing norms surrounding a hegemonic masculinity, which means it does not work in isolation, but is a form of manhood well established in the community. Men's social identity was described as dynamic and arising from membership of a particular social group, where the dominant masculinity was defined by socio-economic and sexual power. Social identity was characterised by close emotional bonds, trust and shared values, but also by economic control and reciprocity that limited the size of the group to four or five men. Interestingly, a self-defined in-group identity of equal power and respect stood in sharp contrast to how they viewed other male groups within which dynamic hierarchies based on current financial power appeared obvious.

*'No, we don't have a leader and there is no hierarchy in **my** group, we all give each other respect and have equal treatment'*

'Yes they (other groups) have leaders because these guys work at different places and they earn differently, so the guy with more money is easy to see and he is respected by everyone in his group'

'Other groups got leaders. That is why I say, if you have a stack of money in your pocket, then you become a leader'

The development and maintenance of concurrent sexual relationships was nurtured by the male core group forming small enclaves in the community. This was achieved through the economic, moral and practical support in the form of providing space and covering up for each

other in order to be able to create and maintain these sexual networks. All the men identified themselves first and foremost as members of a small core group of men that they described as brothers or family, originating from long-term relationships that began during childhood, or via school or prison. The self-defined in-group identity of equal power and respect towards each other was perceived as unique to their own group, whilst other groups were described as hierarchical in structure

Furthermore, given the high unemployment rate and the frequency of casual labour in urban low-income environments, often only one or two group members were employed at a time and they provided financially for the others. Having money gave a person the power to act and make decisions, while those lacking such means were in a more subordinate position. Leadership within a group appeared to be continually redefined according to employment status and access to money. Disposable income was a predominant determinant for leadership within the group but also an indication of overt status, and key to how successful these men were in developing and maintaining sexual networks. Self-reported female sexual partners were known by all members of the male core group, who also supported each other in maintaining these concurrent sexual relationships. The male enclaves were thus a key feature in the setting, important for the recruitment, support and maintenance of large sexual networks. This was achieved through the economic, moral and practical support in the form of providing space for sexual encounters with their sexual networks in each others' houses/shacks as well as covering up for each other in order to engage in these behaviours to minimize the risk of exposure or being caught by their main partners. In the community setting, these formations are known by community members and are part of the social make up and identity among these men.

There is thus a community acceptance for sexual networking on different levels of society. This does not mean that people publicly promote such networks, but the fact that they exist and that men and women are engaged in supporting and maintaining them shows an acceptance of their existence. Despite an expressed concern of being caught with other girlfriends, there is an acceptance of concurrency on a broader level. Firstly, members of the immediate social core group were well aware of the sexual networks, and strongly supported each other in maintaining these concurrent sexual relationships. This means that the creation and maintenance of the networks are is not an isolated event, but rather a collectivistic and well structured socio-culturally manifested form of relations. Secondly, these social structures are also elevated beyond the immediate social context as people in the community are aware of them and it is today a common feature and widely accepted in many societies. To be a player was thus an important part in the identity making process, where not only personal status increased in relation to other men and male groups, but it did also among women, as it demonstrated that they were successful.

Alcohol as a strategy in the formation of concurrent sexual partners (Paper III)

In close association with the lifestyle of the player, alcohol was important in the creation of sexual networks. The multilayered effects of alcohol highlight the need for a contextual understanding of the role it plays, not only in relation to disinhibition and HIV risk-taking behaviours, but also how it is used as a mean of communication between men and women. This is especially evident in the third category of women, described previously as weekend sexual encounters. Alcohol is the pertinent strategy, carrying symbolic values that facilitate the communication

between male groups and women at the local shebeen. The underlying assumption was that a woman who requested or accepted alcohol from a man is willing to engage in sex with him in exchange. The direct gratification was however not viewed as transactional sex or prostitution, but rather as a socially accepted system for communication. However, the reciprocal element was obvious and can be viewed as a transactional act as the expectations were clearly defined. While some men seemed quite realistic about the businesslike nature of these transactional sexual encounters, most tended to rationalise their involvement by couching them in romantic and loving terms. A number of themes were identified that described how alcohol was an important part of the men's social lives and where alcohol served as a key facilitator of multiple, casual sexual relationships.

Contexts where alcohol is an integral part of the social lives of people, the strategies and symbols associated with drinking patterns are important. The close knit male friendship groups embarked on weekend activities that had an explicit agenda: going to local taverns, shebeens or nightclubs in the city centre to drink as much alcohol as their pooled financial resources would permit, with the purpose of meeting new sexual partners. Even those men who did not drink alcohol accompanied their friends to these drinking venues where they too expected to meet new sexual partners, using their friend's alcohol strategy.

“So what we do if we go out to the shebeen is to make the table black [] And the girls in that place they like to weigh which table is heavy, so it is easy for us to get girls in that way when we put a lot of alcohol on the table at once. A lot of girls can see that we are warm in our pockets” [this is a metaphor referring to someone or a group with a lot of money].

A typical weekend evening followed a set structure, starting with choosing a venue, buying large quantities of alcohol and spreading it over their table, which was called ‘making the table black’. This strategy was employed specifically because the perception is that men who bought large quantities of alcohol were perceived by women to be wealthy; and women were only attracted to men whom they thought were wealthy and generous.

“You see the way it works, by the time you start buying beers for the lady and give her some money that is where everything start, because she can see....that this one has money and he is buying a lot of alcohol. Then she decides that she will stick to you because she sees that she is getting free alcohol here and maybe she can get some money too, then this is the opportunity for you to take her home at the end of the night”

This strategy also worked as a demarcation between male groups visiting the venue. These groups are hierarchical in nature, and it is important to position the group in relation to others. However, not only the quantity of alcohol was important in attracting the women, so too was the quality of alcohol. In this way, the overt display of large quantities of superior quality alcohol (whiskey and cider were perceived as more classy in comparison to beer) was seen to symbolise wealth and generosity: both of which were perceived by the men to be important in attracting women to them. Thus, alcohol became an important part of initiating a dialogue and key in the relation-creating strategy. Women would circulate between the tables in the tavern or shebeen,

assessing the worthiness of the men according to the quantity and quality of alcohol they were displaying on their tables. The women would then wait for an invitation to either join the table, or an offer to purchase a drink for them. To satisfy what seemed to be a need for immediate sexual gratification, many of the men expected that they would have sex with the women at the end of the evening, if not during the course of the evening. For some this meant engaging in sex within hours of meeting their women, and in any convenient place.

The systems and symbols surrounding the culture of alcohol make visible the contemporary gender dynamics as well as the hierarchical social structures that are prevalent in these contexts. It also highlights the latent association of alcohol to transactional sex and to sexual events that increase risk for HIV; these connections are relatively unexplored. In these ways, alcohol worked as a multilayered force in the communication within the hierarchical core group of men, in the hierarchical structure relating to other groups of men, as well as with female counterparts. Thus, the representation of alcohol within existing explanatory systems is part of the process of creating and distributing ideas and concepts of the 'other' and the 'self', which is used in the communication with women. Alcohol is used as a culturally sanctioned symbol and means of communication which is part of expressing manhood and specifically that of a hegemonic masculinity.

Underlying reasons for concurrent sexual partners and networks (Papers I and II)

The formation and support of sexual networks and means of communication to create such networks via for example high alcohol use represent a structure of high risk behaviours. Themes associated with distress, disempowerment and insecurity as well as biological determinism were factors given as explanations for high risk behaviours. One way for these men to legitimize certain practises was to express sexual relations as based on biological determinism. One commonly expressed view was grounded in the belief that men have a greater need for several sexual partners than do women, as well as being 'built' for sexual encounters.

"It is because of our different sexual orientation where guys deposit and ladies receive. Because this, (the vagina), looks like a rubbish can where we throw everything in it"

"Because the girl's body is destroyed pretty easy when she has a lot of men, and the guy's body does not deteriorate that easy with many girlfriends"

These men referred to the biology of men as a way to explain and legitimize certain high risk behaviours, such as having large sexual networks. Also the view of men's bodies as created for penetration shows a polarised understanding of the opposite sex. In comparison with themselves, most men considered women to be physically vulnerable when engaging in sexual intercourse, especially with several sexual partners. The interpretation of the male body is thus an important part of the make up of a male sexuality. Furthermore, these biological explanations further highlighted strong, negative perceptions of women and female sexuality, which helped polarize men's interpretation of gender constructions. The fact that women often challenged predominant gender stereotypes by engaging in what was perceived to be normative male sexual behaviour was used as an excuse for degrading attitudes and behaviours toward them.

This could explain men's use of metaphors such as the 'rubbish can' for the vagina, as well as the association of women as being 'destroyed' or 'finished' if they had multiple sexual partners. Despite the biological determinism expressed, the socio-cultural ideals are the dominant factor, where the sexual biology of men and women are used to legitimize behaviours.

Another reason for having several concurrent girlfriends was a lack of trust in women due to the possibility of unfaithfulness, or as security if one of the girlfriends should leave the relationship.

'Because I am not there and she goes to a shebeen, who will buy her booze? That man will buy booze and expect something; he will never take his money out of his pocket for nothing'

'It is for security reasons, because if one of your many girlfriends dumps you, then you can easily move to the next one'

An underlying stress due to the possibility of unfaithfulness in relations pointed at a power play between the sexes, which further implicates a lack of control in sexual relations. Many of the men believed that women actively engaged in concurrent transactional relationships for economic benefits. This interpretation of women as active agents in relationships created a deeply rooted insecurity among men that alienated them from women.

"According to me.... all my friends actually. They cannot keep one partner anymore because they don't trust, that is why they are going around"

"They are also players, because the thing is unemployment rate, if that can be organized to get jobs, maybe they can start their lives themselves. Now I know that they depend on me. If I do not give you money they will go to the next person"

The commonly expressed negative perceptions of women were thus multilayered and reflected an intricate power play that included lack of control and distrust of women. Furthermore, the participants described that by having several girlfriends, they also increased their status among women as well as among other men, demonstrating that they were successful and powerful. Thus, the expressed lack of trust in women promoted a strategic plan to secure the perceived high status image of a man, should one of the concurrent girlfriends leave the relationship. Men often felt a need to secure their status by maintaining a number of women in the sexual network, based on these presumptions. Women were thus perceived as active agents in sexual relationships and not passive victims. Most of the men depicted a deep-rooted insecurity in their relationships with women that fuelled the quest for wider sexual networks. This underlying distress and insecurity among these men can be seen as a sign of a situation where the traditional hegemonic masculinity is contested, bringing new forms of masculinity into the context to compensate for the perceived disempowerment among this group of men.

“They are players like us because we think we play them and they are playing also their cards, they are playing us also”

“They (women) got so much power now. We got less power. [] Because the women rights are too much”

The urban context characterized by lack of money and self-perceived disempowerment among men in relation to women (and society in general), created a situation where manhood was constantly questioned. Men's distrust and a perceived disempowerment in relation to women supported the formation of large sexual networks characterized by unequal power dynamics. Sexual relationships within these networks were often based on direct economic reciprocity, which is common in urban and peri-urban townships where people struggle to meet basic needs. The construction of the 'player' not only involved the manifestation of material wealth and multiple girlfriends, but also offered a set of norms by which to judge the behaviours of female sexual partners. Irrespective of whether the woman had long term concurrent or temporary sexual encounters, strong and negative views were revealed. A woman who crossed the strict boundaries that existed for gender relations was often labelled a 'bitch'; a term sometimes also used to describe females in general. The informants did not view 'bitches' or women as passive victims, but rather as active agents who strategically played their cards. Thus, a certain ambivalence was revealed in men's views of women and the opposition between sexes.

Sexual risk reduction strategies among HIV + men (Papers I, II, III IV)

Among men in Sub-study 1 (Papers I, II and III), few sexual risk reduction strategies were expressed. HIV-specific knowledge was low and often not a direct concern among these men, even though several of the men reported having recurrent episodes of sexual transmitted infections, which shows that they engaged in unprotected sex. With the woman identified as the main partner, condom use was reportedly very low or non-existent. For the other category of permanent girlfriends, men reported that condoms were used inconsistently and only occasionally when there was a perceived risk of pregnancy or infection when engaging sexually with these concurrent girlfriends. However, self-reported condom use was higher in temporary sexual encounters, but was dependent on a subjective assessment of each girl. Many participants explained that if the girl looked healthy and was good looking, she was often assessed as safe in terms of HIV infection. Although these temporary sexual encounters do not endure over time, they are nonetheless part of concurrent relationships and have the potential for high HIV transmission within and between other sexual networks. This trend of inconsistent condom use was further exacerbated via alcohol and the need for sexual gratification (Paper III). Some men spoke about the effect that alcohol had on their ability to use condoms and to use them correctly. While these men were aware of the risk of HIV that not using a condom with casual partners presents, haste and over-consumption of alcohol overrode this awareness, or interfered with their ability to wear a condom properly.

In Paper IV, sexual high risk taking among male patients in Kenya prior to the enrolment into the ART programme was reported. For these patients, sexual risk reduction strategies were a new event as HIV-specific knowledge and acceptance of their HIV status came at a very

late stage in the disease progression. This was often after they had developed AIDS-related symptoms corresponding to WHO stages 3-4. Several men reported that they had tested positive previously, but had chosen to ignore or deny the results until they were tested for a second time, following severe illness. Most participants were then immediately started on ART due to low CD4 counts. All the participants had been sexually active with one or more partners prior to the development of opportunistic infections. Many of these men had a wife up-country who they visited on a regular basis, but they also had concurrent girlfriends while residing in Kibera. When experiencing symptoms such as headache, diarrhoea, herpes zoster, severe rashes often combined with general weakness, the libido and lust for sex disappeared. However, physical illness was not the only reason for decreased libido: the knowledge of being HIV-positive and the associated psychological stress were an important factor. The decline in libido was often reported six to twelve months before being enrolled in the ART programme. After starting medication with ART the participants experienced a return of their libido after approximately one year, but this did not automatically lead to a resumption of sexual life, due to fear of possible complications learnt at the counselling sessions.

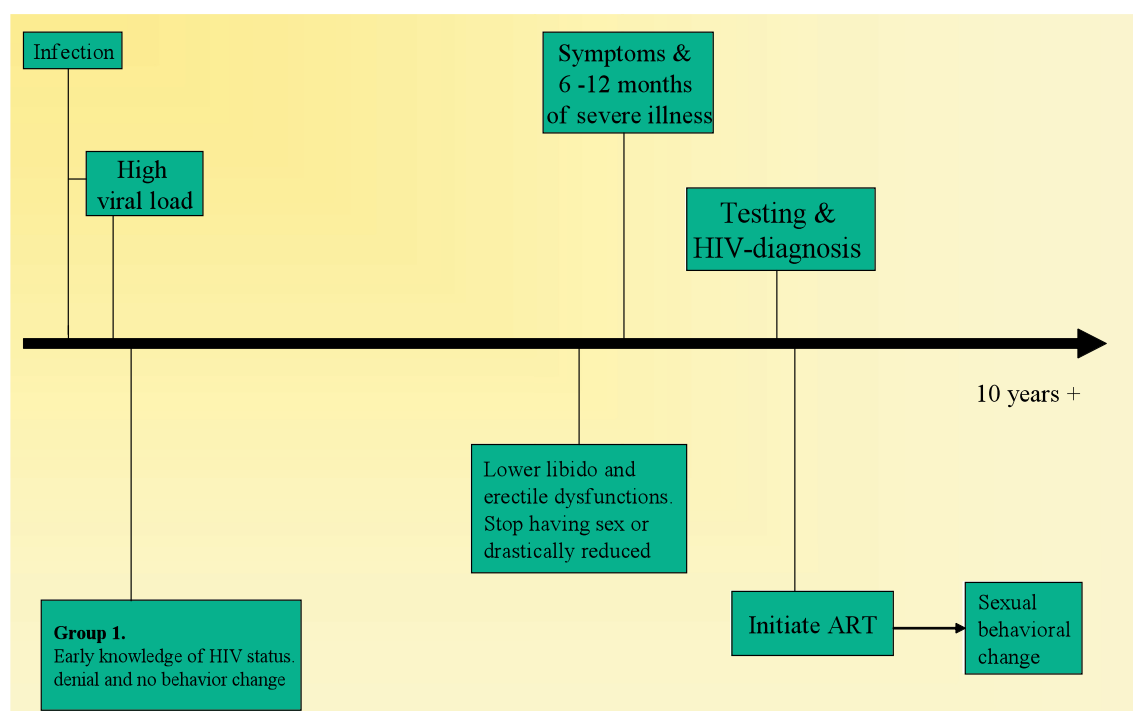


Figure 3. Sexual life-line

Figure 3 gives an overview of male ART patient's sexual life-line and experiences. Most learn their HIV status very late and among those that were tested HIV-positive early, it was common to ignore or deny the results, often with little or no behavior change. Only after developing HIV-related symptoms/ experiencing of severe illness, did the patients start to accept their HIV status and adhere to information given, due to fear of symptom relapse.

The sexual lifeline before and after initiating ART had similar characteristics among the patients, showing that these men were at high risk of sexually transmitted HIV prior to their contact with the health care system. Multiple sexual partners were also combined with consistently low condom use. In reality, none of the men interviewed reported previous experience of condoms prior to the initiation of ART, and that the knowledge on how to

use them was fairly new. Following an active decision to take on new sexual risk-reduction strategies, two options came across as preferable: reduction of sexual partners and condom use (this excludes those that had chosen abstinence as an option as they at this point were not sexually active due to illness and the recent initiation of ART, but planned, if possible, to return to having a sex life). All participants reported having both concurrent and/or several partners and temporary sexual encounters prior to experiencing HIV-related symptoms and prior to being aware of their HIV status. One dominant factor that triggered sexual behaviour change among these male patients was articulated as fear and was directly related to the patients' own personal experience of prolonged and severe illness prior to HIV testing and the initiation of ART. Fear of re-infection or symptom relapse were clearly linked to the new knowledge obtained through counselling at the health clinic, supplemented by information from other sources such as mass media and friends. In the process of integrating knowledge of their status and considering new behaviours, it was clear that the participants did not want to endanger their own health and this worked as a key trigger. However, few acknowledged the risk of infecting others as a motivating factor for sexual behaviour change.

Reduction in the number of concurrent or temporary partners as a risk reduction strategy was considered the first option for participants at an individual level (Paper IV). This was often related to problems associated with disclosure and potential stigma.

"I just wait until the next time I can be with my wife. I cannot go having sex with other women because I will have to use a condom and they might start asking why I am using a condom. I would not be so comfortable telling this other person that I am HIV-positive. This other person maybe does not or has never used a condom. To avoid too many questions and explanations, I just wait for my wife"

By reducing the number of partners, participants had taken on a new sexual risk reduction strategy, which was under their control. Among participants living in relationships, most had disclosed their HIV status to their partner with different outcomes. Some partners had left the relationship when they were informed, while others had chosen to stay in the relationship.

In most cases, the choice was dependent on what kind of sexual relationships these men had. All participants reported having both concurrent and temporary sexual encounters prior to experiencing HIV-related symptoms and awareness of their HIV status. Sexual relationships with several partners were a reflection of the social lives of these men, who moved between the wife and family up-country, and settlements in the city to search for an income to support the family, visiting the family just a few times a year. This lifestyle, common to many urban migrants, has had a major impact on the social cohesion of families.

Besides partner reduction, consistent condom use was also considered important for reducing the feared risk of re-infection. All patients expressed that they had not used condoms prior to enrolment in the programme. No clear reasons were given other than it had not been in their mindset, part of their lifestyle or that they perceived themselves as not at risk for HIV infection. Thus, the risk of becoming infected had not been a priority, both due to lack of HIV-specific knowledge and to contextual norms where condom use is not widely accepted or practised.

“I would have to use a condom if I were to have sex now. I do not know if it will be something hard. It is not something that I have used before. I do not know why but I was not interested in using condoms”

“I used to think that the girls I went out with were well so I never used a condom. I did not think they could contract such a disease so I used to believe that they were safe”

Consistent condom use was thus a new experience to all the men interviewed in this study. It was expressed that the use of condoms in temporary and concurrent relationships put participants under unwanted pressure to disclose their HIV status and thus regarded as a more difficult option for sexual risk reduction. This, in combination with the fact that participants had never used condoms before their HIV diagnosis, shows that condom use requires a dramatic change in attitudes and behaviour. Furthermore, adoption of sexual risk reduction strategies is a long process involving acceptance of HIV status, assimilation of information along with clinical support, which has to be constantly discussed and reinforced.

Resistance to condom use by female partners was perceived as one of the major obstacles to safe sex for participants. Women often associated condoms with something dirty and bad that prostitutes would use. Therefore, several men expressed that they found it difficult to argue for and introduce condoms in their relationships.

“She got the information from a nurse, but she is not happy with condoms. She thinks that condoms are not fresh or clean. Yes. I am trying to convince her but she doesn't accept it. This will reduce our life time”

However, men's perceptions of real or potential obstacles in introducing condoms could also be viewed as an externalisation of responsibility when it comes to risk reduction strategies: by viewing disclosure to their main female partner and condom use as key barriers. Even though all participants reported some changes in sexual behaviour following the initiation of ART, there were several perceived barriers when trying to follow recommendations given by health care staff. One dominant obstacle reported was poor support from their female partners to use condoms consistently

In addition to perceived difficulties of introducing condoms into their sex lives, socio-cultural norms and family expectations were expressed as additional barriers to reducing the risk of HIV transmission. Strong collective pressure from immediate and extended family members was related to societal norms and traditions that stress the importance of reproduction and expectations. Strong expectations from the community on how to act as a man is a pertinent factor that affects the way men feel they can act in sexual relations. The feeling of being trapped or of lacking control over decisions concerning sexual practices, family obligations and reproduction were perceived as major obstacles to sexual risk reduction strategies.

Risk factors associated with unsafe sexual encounters (Paper V)

In Kibera, close to one third of HIV-positive male and female patients reported inconsistent condom use and this indicates high numbers of potentially unsafe sexual events. Multivariate regression analyses showed that gender and time on ART were important predictors of inconsistent condom use, with a trend showing that shorter ART use was significantly associated

with inconsistent condom use. Patients who had been on ART for more than 19 months had a significantly increased likelihood of consistent condom use, compared to those who had been on treatment for less than 6 months (19-24 months, adjusted odds ratio for age and sex (aOR) 0.31, 95% CI 0.12 – 0.84 vs > 2 years aOR 0.45, 95% CI 0.23 – 0.88). Female ART patients were more than three times more likely to report inconsistent condom use than male patients on ART (aOR 3.03, 95% CI 1.60-5.72). Additionally, employment of any kind seemed to have a possible protective effect against inconsistent condom use. Patients defining themselves as casual labourers reported inconsistent condom use significantly less often compared to unemployed patients (aOR 0.45 95% CI 0.23 – 0.87) and employed patients also had a decreased likelihood of inconsistent use versus unemployed (aOR 0.59 95%CI 0.32-1.10). No significant interactions were found between the independent variables.

Table 2. Bi and multivariate logistic regression for inconsistent condom use during the previous six months

Variables	Crude OR	95% C.I	aOR [§]	95% C.I	p-value
<u>Sex</u>					
Men	reference				
Women	2.38	1.44 - 3.96	3.03*	1.60 – 5.72	0.001
<u>Employment status</u>					
Unemployed	reference				
Employed	0.86	0.51 - 1.44	0.59	0.32 - 1.10	0.096
Casual Labour	0.51	0.27 - 0.93	0.45*	0.23 – 0.87	0.019
<u>Time on ART</u>					
1-6 months	reference				
7-12 months	0.83	0.43 - 1.58	0.92	0.47 - 1.84	0.825
13-18 months	0.60	0.24 - 1.48	0.67	0.26 - 1.73	0.407
19-24 months	0.29	0.11 - 0.76	0.31*	0.12 - 0.84	0.022
2 years >	0.49	0.26 - 0.92	0.45*	0.23 – 0.88	0.020

* p-value <0.05

§Adjusted for: Number of sexual partners in the last 6 months, age group, educational level.

Furthermore, there was a borderline significant association between marital status and having multiple sexual partners among patients receiving ART (p-value=0.054). Within the group of men, unmarried men were less likely to have had multiple partners in the previous six months compared to men who were married (aOR=0.20). In addition, married men were more than four-fold more likely to have had multiple partners during the previous six months compared to married women (aOR 4.38 95% CI 1.82 – 10.51), while we did not find a significant difference among unmarried men and women. The tendency to engage in multiple partnerships was thus strongly associated with male gender and marital status among male patients. In the group of women, marital status did not significantly influence multiple partnerships. This shows that multiple sexual partners is an important factor for HIV transmission, especially among men and thus needs to be targeted in prevention design.

Table 3. Bi and multivariate logistic regression for having more than one partner during the previous six months

Variables	CrudeOR	95% C.I	aOR	95% C.I	P-value
Constant			0.06		<0.001
Sex					
Women	reference				
Men	3.14	1.72 - 5.71	4.38*	1.82-10.51	0.001
Marital status					
Married	reference				
Unmarried	0.435	0.23 - 0.81	1.15	0.45-2.93	0.770
Sex:Marital status	0.478	0.11 - 2.05	0.18**	0.03-1.02	0.054

* p-value <0.05

** p-value <0.10

The statistics show that potential risky sexual encounters are taking place and that married men are strongly associated with multiple sexual partners, even among patients that are receiving ART. It is important to understand these networks in relation to biomedical interventions, as potential HIV transmission might occur.

DISCUSSION

The aim of this thesis was to explore the construction of sexual risk behaviours and sexual risk reduction strategies among males in urban poor-resource settings in Africa with implications for sexually transmitted HIV and prevention strategies. For many existing interventions it has been assumed that the individual has the autonomy to make and act on his/her own choices, not considering that individual agency is constrained or shaped by structures in the social context [148]. The social context and the knowledge about people's understanding and interpretation of sexuality and HIV and AIDS, and insights into the competing interpretations of the disease that impact both positively and negatively on HIV prevention efforts and thus on the effectiveness of programmes, have been scarce, and largely ignored in health behaviour research and interventions [149].

An ideal masculinity among high risk males in urban townships (Paper I and II)

High risk sexual behaviours have been outlined in many articles lately, where concurrent sexual relationships coupled with inconsistent or no condom use are stressed as key in the SSA HIV epidemic development [177-180]. Thus, a better understanding of gender and sexuality in the heterosexual epidemic for risk and prevention is needed [54]. The dominant masculine ideal (Papers I-III) - the 'player' - thrived on money, multiple concurrent sexual relations and casual sex as well as excessive alcohol use. Strong social pressure within male core groups to pursue and maintain concurrent sexual relationships and temporary sexual encounters existed and helped legitimize specific behaviours that the player represented. The common use of derogatory words attributed to women or their genitals, such as 'bitch' and 'rubbish can', dehumanized women and restricted female sexuality in order to retain and in some instances reclaim male superiority. Women were perceived as too empowered and could not be trusted, making men feel alienated and lacking control in (sexual) relationships. The lack of trust in women's fidelity was stated as an important reason for engaging in concurrent sexual relationships as well as casual sexual encounters. This supports previous research showing that new masculinities can contain large sexual networks as a way to express manhood, and that they work as a response to societal changes, unemployment and poverty, low self-esteem and a self-perceived disempowerment [181].

Furthermore, bringing biomedical efficacy intervention into traditional mores as a way to increase the community effectiveness of programme or as a structure for behaviour intervention has been discussed but is in many ways a new idea in relation to biomedical HIV prevention. For example, the global debate on potential benefits of circumcision in relation to HIV infection has largely had a biomedical focus, thereby ignoring the very important core of traditions and the context in which it is stipulated. By taking into account the traditional importance of rites of passage, the power of successful intervention might not be solely in the removal of the foreskin, but rather in the development of structures in which boys can, in terms of sexuality and gender

awareness, be socialized into responsible men. The potential in bridging traditional systems with medical interventions has shown promising results and is currently recommended [182]. However, further research is required around the effectiveness of such bridging, as well as to assess potential harm reduction associated with circumcision [106]. Traditional structures could be one such entry point as they are important and give meaning to people, but there is a need for further research on models for effectiveness in interventions.

Supporting structure of social and sexual networks among males

(Papers I, II, III)

In Papers I, II and III, the multilayered feature of concurrent sexual networks showed that they are part of expressing specific forms of ideal masculinity as well as associated means of communication. These masculinities have evolved due to historical, economical and political changes in transitional, peri-urban societies. This makes young and dynamic urban settlements particularly vulnerable to HIV transmission and to other social and health problems. The player as a form of masculinity would not exist if there were no support in context. Men's social identity in this specific context arises from the membership of specific male groups, where men's *self defined* identity was that of an equal in-group structure, which made them unique to other male groups in the context. Although it was clear that a hierarchical dynamic was present among all groups with a reciprocal relation between its members constantly negotiated and restructured according to economic power and perceived evidence of masculinity through multiple sexual partners. The male group identity was essential in the formation and maintenance of concurrent and temporary sexual relationships that communicated a dominant masculinity and power in context. These social dynamics also influence men's interaction with women, where the structural and economic support enabling the group members to pursue and maintain temporary and concurrent sexual encounters, creates extensive sexual networks. Besides the identified main partner, several concurrent girlfriends as well as temporary sexual weekend encounters were described. Thus, what was described by these men was the complexity, quality and quantity of sexual networks, which creates a fertile ground for HIV transmission [35] [183]. Mobility between locations for temporary sexual encounters allowed linkage between sexual networks in other geographical areas, potentially fuelling the spread of HIV transmission between networks across a larger area.

Others have stressed that concurrency alone cannot explain the rapid spread of HIV and that other confounding factors must be part of the explanation [184, 185]. The complexity of a health problem and potential confounding factors are always present. A recent review by Mah and Halperin shows that there are clear indications that concurrency is much more prevalent in SSA compared to other regions of the world and constitutes a high and real risk in the HIV epidemiological development [179]. The concurrent sexual relations with steady partners and large numbers of short-term and casual sexual relationships described by these men include several enhancing risk factors that could contribute to maintaining a high HIV prevalence. These include geographical and age mixing, inconsistent condom use and low risk-perceptions. A high prevalence of other STIs in South African urban settings [186] and high-viral load in newly infected individuals not yet aware of their status and not yet on ARVs, further exacerbates the risk for HIV transmission. The urgency to address concurrent and multiple partners in HIV prevention in the high HIV prevalence countries in southern Africa was highlighted by the Southern Africa Development Community (SADC) and UNAIDS in 2006. In the meeting they

concluded that ‘high levels of multiple and concurrent sexual partnerships by men and women with insufficient consistent, correct condom use, combined with low levels of male circumcision are the key drivers of the epidemic in the sub-region [187].

Interventions targeting behaviour change among different, defined sub-populations for example youth are undertaken in different settings, but are often small-scaled and do not reach larger proportions of the population. Reporting from these interventions tends to be anecdotal and few have been designed with rigorous research design linked to biological outcomes such as HIV incidence and are thus unlikely to show any evidence of effectiveness [188]. Even fewer interventions are directly targeting masculinity norms that include concurrency, sexual risk reduction strategies as well as other associated risk factors such as violence, alcohol and more [54] are scarce or only undertaken by few organizations worldwide [180]. The formation and support structure for an ideal masculinity such as those described above, needs to be addressed in preventions as it is central to sustained behaviour change as well as in relation to other biomedical interventions to increase the effectiveness of such. However, there is a need for more and better designed research in relation to sexual behaviour change interventions as these types of studies are few and the overall body of evidence is weak to guide future interventions especially in relation to biological outcomes [189].

Communication strategies and alcohol as facilitating factor (Paper III)

This group of hard-to-reach and sexually active men, depicted as players, socialized with friends at shebeens, bars and taverns where the display of large quantities of alcohol and the consumption thereof formed an integral part of their social lives. Critically, alcohol is a core facilitator in sexual relationship development and a way to communicate with women and other male core groups. In the absence of alternative forms of leisure activity and the paucity of available recreational facilities combined with a culture where multiple, concurrent partnering is sanctioned and promoted [190], and the use of condoms is still eschewed by many men [191], alcohol is used as a convenient and often used rationalization for high risk sexual encounters. For others it would seem that intentions to use condoms existed, but that alcohol use interfered with (correct) condom use. Studies conducted in other sub-Saharan Africa settings show that alcohol use is significantly associated with HIV-related sexual risk behaviours and HIV infection. The rate of alcohol consumption in South Africa among those who drink alcohol is estimated to be approximately 20 litres of pure alcohol per drinker per annum—one of the highest rates of consumption in the world [192]. A systematic review and meta-analysis of 20 African studies [193] and a study in Uganda among women [194] found that high levels of alcohol consumption were associated with HIV sero-positivity and sero-conversion. Other studies show that alcohol use is associated with an array of risky sexual behaviours, including inconsistent condom use, multiple, concurrent, sexual partnering, transactional sex where money and/or alcohol is exchanged for sex and physical violence and sexual coercion [194-199]. Findings show that drinking among male peers of the same age fostered a sense of solidarity and worked to reinforce a prevalent masculine ideal of excessive drinking and the pursuit of new sexual partners [200]. This latter behaviour was facilitated by the disinhibitory effect of alcohol used to be able to communicate sexual desires, to propose sex, to increase sexual arousal and to promote the need for immediate sexual gratification [190].

Closely related to excessive alcohol use and a bar culture where these male groups socialized, was transactional sex. Although findings from many studies in sub-Saharan Africa have described transactional sex as a means for women to survive in a context of economic need,

others have suggested that women engage in transactional sex not from economic need but as a means to acquire material goods such as cell phones, new clothes, and so forth [201-203]. Many young women are becoming aware of their exploitation by men in sexual relationships. Transactional sex accompanied by multiple sexual partnering becomes their way of (economic) exploitation of men, resulting in feelings of power [203, 204]. Indeed, it has been suggested that women deliberately develop strategic sexual relationships with multiple sexual partners who can provide them with modern material goods in “pursuit of modernity” and becoming a “modern girl” [203-207]. This was identified in Paper II, where an explicit insecurity was expressed by men along with their lack of trust in women. Despite women’s empowerment as perceived by men, their risk of contracting HIV is not mitigated as it is still likely that their agency stops at the point of the sexual act. In accepting alcohol and/or money for sexual exchange, the ‘paying’ partner gains sexual leverage and the right to guard and use his ‘investment’ in whatever way he chooses [208]. Thus in sexual relationships characterized by exchange, a woman is likely to be signing away her rights and power to negotiate the terms on which sex takes place between her and her partner, including condom use [204, 206, 209, 210].

The findings from this study feed into an existing conceptual framework suggested by Morojele and colleagues [190], which proposes a culture-specific interrelationship between alcohol use and risky sexual practices. It proposes a number of fundamental reasons for heavy alcohol consumption - also referred to as distal predictors of alcohol-related sexual risk behaviours. The next link in their model is between alcohol use and the psychoactive effects of alcohol that in turn operate to exacerbate risky sexual behaviour. Their model goes on to suggest a number of moderating factors that strengthen or weaken the association between alcohol use and the psychoactive effects of alcohol, and between the psychoactive effects of alcohol and risky sexual behaviour. The moderating distal factors include economic, societal/cultural, masculine ideals and community factors, drinking environment; and proximal, individual factors and expectancies. In the latter case, for example, people’s expectations that alcohol use will increase sexual arousal and desire or that alcohol use makes one less inhibited in proposing sex, will cause them to drink. Without exception, these men reported alcohol consumption and the pursuit of (multiple) sexual partners as central to their weekend socializing activities. Evidently these two behaviours form a part of their masculine ideal and we propose that these context-specific masculine ideals found deserve greater visibility at this distal level. Second, although Morojele’s model ignores the influence of transaction in sexual relationships, our findings suggest that transactional sex plays a pivotal role in both excessive alcohol use and multiple sexual partnering. Third, we suggest specific risk behaviours under Morojele’s model’s broad label “Sexual Risk Behaviour” that has practical implications for HIV interventions. One way to satisfy the one part of this masculine ideal (i.e., to have multiple sexual partners) is through transactional sex. Many men explained how they deliberately used alcohol in their strategy to attract women to them and then as a currency in transacting for sex. The other part of the masculine ideal, excessive alcohol consumption, operates at three interwoven levels that increase risk behaviour. First, alcohol use operates bi-directionally in its relationship with transactional sex. It provides the person seeking out new sexual partners with decreased inhibitions and increased confidences in proposing sex either directly or moderated by expectancies. Additionally, alcohol is used as an important currency in the transaction for sex and alcohol use promotes inconsistent, incorrect or no condom use, despite knowledge of the associated risk of HIV this poses. Likewise, findings from other studies referred to earlier have shown that within transactional sexual relationships the balance of power lies with the “paying” (male) partner in determining the conditions of sex, specifically whether or not condoms are

used. This suggests that at the proximal, individual level, condom use is inextricably linked to both transactional sex and excessive alcohol use, and both these behaviours increase the risk of HIV infection and transmission among those involved in the (multiple) sexual transactions. Discrete behaviours such as reducing the number of sexual partners one has and/or adopting a more responsible use of alcohol are arguably amenable to intervention and adoption as a starting point in addressing the broader, deeply entrenched masculine ideals that work to (re)confirm men's power in relation to women [211].

Sexual risk reduction and factors facilitating behaviour change among ART patients

In the last decade HIV and AIDS treatment programmes have not been coupled with concomitant efforts to support HIV prevention [3]. The reduction in viral load in individuals treated with ART has led to overly optimistic expectations about the ability of treatment to limit the HIV epidemic [43, 77, 143]. However, epidemic modelling does not support this assumption [212, 213]. In addition, several studies have reported that although genital shedding of HIV does decrease after initiation of ART, there is often incomplete suppression with a low correlation between HIV-RNA levels in blood compared to semen and vaginal fluids [214-216]. The risk of HIV transmission is also dependent on an individual's ability to adhere to the medical regimen, which affects development of resistance to treatment drugs and viral load [217]. Additional and crucial behavioural determinants of sexual transmission include inconsistent condom use, especially in combination with concurrent sexual partners [34-36, 218-223].

Research on sexual behaviours of patients on ART shows contradictory results. Several studies from high income countries, which predominantly focus on gay men, have shown increased risk taking with large numbers of high-risk sexual events taking place [43, 45, 131-133, 224]. In another recent systematic review, no association between ART initiation and increased sexual risk taking were shown [225, 226]. In a study by Diamond et al carried out in California, high levels of ART adherence were associated with decreased high-risk sexual behaviour [134]. However, experiences from high income settings are of limited value when addressing low-income, high-prevalence settings that are characterized by weak health systems, limited human resources capacity, and health services poorly adapted to large-scale ART delivery [130, 227].

The majority of ART patients in resource-poor settings are diagnosed at a very late stage of their HIV infection, implying high viral loads at the start of treatment [34, 36, 134, 223]. This is especially the case for men, where HIV is diagnosed much later compared to women [180], and often this correlates with pregnancy and that women are enrolled into programmes for prevention for mother-to-child transmission (PMTCT). Men have a tendency to seek help at a much later stage due to several factors where norms of masculinity impact negatively on men when it comes to health seeking behaviour and exposure to risk [70]. Nevertheless, people do engage in unsafe sexual activities, with or without knowledge of their sero-status. As shown in a study recently undertaken in South Africa, almost half the participants just initiated on ART had unprotected sex at last intercourse [228]. This should be seen in relation to Papers IV and V, which represent patients who have entered a relatively well-functioning ART programme with an inherent support structure focusing on patient education and information [217]. Even so, sexual risk taking was prominent, not least among those who had recently started on ART. Preventive strategies in ART programmes have to work within complex socio-cultural systems, especially in relation to gender dynamics. Safer sex practices are often a collective concern,

where sexual practices do not work in isolation, but in strong relation to norms in the society, forming powerful barriers to sexual risk reduction strategies. It is of key importance from a public health perspective to address this in biomedical interventions. HIV has to be detected at a much earlier stage, especially among men as the tendency is that they are either detected late in relation to the occurrence of opportunistic infection or that they have been in denial for years if detected as HIV-positive previously. Thus, structural strategies such as partner notification should be explored as a useful way of targeting these groups for earlier detection and preventive interventions. However, partner notification is not widely used in low-income settings and it has been criticized as a strategy from a human rights perspective [229].

The first self-reported option for risk reduction was to cut back on the number of concurrent sexual partners (Paper V). This was perceived as an easier, individual decision that provided a sense of control, where these men themselves decided with whom to engage sexually. Staying with one partner and revealing one's HIV sero-status was also considered an easier option compared to disclosure to several people. Consistent condom use was considered more difficult as it had to be negotiated and was often contested by female partners. Previous discussions on condom use have mostly dealt with how to empower women in relationships to be able to negotiate condoms in sexual encounters. However, men's fear of stigma and rejection when introducing condoms to female sexual partners are rarely discussed. In addition, most participants had complex socio-cultural barriers to overcome. Societal norms and partner pressure to reproduce counteracted the process of changing and maintaining new sexual behaviour, and were perceived as major challenges.

Cultural expectations to get married and have children made safer sex practices a collective dilemma. Men's sexual agency does not work in isolation, but within strong societal norms, forming powerful barriers to sexual risk reduction strategies especially among HIV sero-discordant couples and young HIV-positive individuals. From this perspective, people's actions should not be understood as irrational, but rather as informed and influenced by factors on a macro-level that are highly contextual [82]. Cultural and social expectations about male sexuality and manhood may counteract preventive messages and limit men's abilities to take on new safe sex practices. It is important for counsellors and other staff to determine and discuss each person's socio-cultural situation and personal obstacles to safer behaviour, such as reproductive needs and marital status, to help endorse and sustain new behaviour. Also, future HIV prevention interventions need to address personal, micro- and macro-level factors of behaviour to encourage individuals to take on sexual risk reduction strategies in order to achieve the anticipated preventive effect of ART.

In Paper IV, sexual risk reduction was closely associated with experience of AIDS-related symptoms before the initiation of ART. Fear of symptom relapse worked synergistically with HIV-specific information provided by health workers and triggered an individual decision to take on sexual risk reduction strategies. The individual experience of severe illness became part of a process that helped facilitate both the acceptance of HIV status and ART, and strategies for behaviour change. The expressed fear of symptom relapse in relation to previous experience was given as the reason for behaviour change. A meta-analysis on fear appeals supports evidence of the persuasive effects of fear appeals accompanied by high-efficacy messages, where fear appears to be a great motivator as long as individuals believe they are able to protect themselves, i.e. self-efficacy [230]. So in the case of our study, the combination of the three; experience, fear and self-efficacy could be a model to use in behaviour change programmes. This is however, highly dependent on skilled counselling and support given to patients. Furthermore, the late initiation of ART and changes in sexual risk-reduction behaviours among these men, further

implies that the effectiveness of ART as a tool to control the HIV epidemic is questionable as the majority of people in settings like Kibera are diagnosed at a very late stage of their HIV infection (Baggaley et al. 2006; Granich et al. 2009; Stolte et al. 2004). This also shows that ART has no or little direct effect on sexually transmitted HIV as these men stopped having sex before the initiation of ART. However, high risk events had taken place for many years before that, not least in the primary infection phase when they were highly infectious. There is thus a strong need for other preventive strategies targeting people still unaware of their HIV status to reduce the number of new HIV infections.

Sexual risk factors among female and male ART patients (Paper V)

In Paper V, factors associated with sexual risk taking among HIV patients on ART was analyzed and showed strikingly high levels of inconsistent condom use among men and women (almost 30%). Women were significantly more likely to report inconsistent use of condoms (aOR 3.03) compared to men, even when adjusted for the reported number of partners. Even though condoms are widely available, either free or at a minimal cost, patients, and especially women, are likely to face a range of barriers to condom use. Paper IV, showed that lack of individual decision making power in intimate relations, sufficient knowledge nor part of a sexual risk reduction culture prior to exposure to information in ART programme was common among male ART patients. This was coupled with social pressure to conceive a child or other social-cultural demands which further increased the risk for HIV transmission. This is supported, in other recent studies [231-235], showing that reproductive wishes play an important role in society and HIV-positive women and men may experience the pressure to fulfil normal social expectations. Furthermore, Paper IV also revealed strong negative associations with condom use such as 'condoms are dirty or are for prostitutes only' among women were additional obstacles for consistent condom use in this specific setting.

In addition, a high number of married men reported multiple sexual partners during the previous six months. Thus, gender was identified as an important determinant of both inconsistent condom use and multiple sexual partners. Significantly more married men (aOR 4.38 95% CI 0.82 - 10.51) than married women reported more than one sexual partner during the six months preceding the interviews. These men are at risk of exposing themselves and others to re-infection with HIV and seemingly sexual risk reduction strategies are not well integrated in their behaviour. Similar findings have been reported from studies on male sexuality and risk reduction strategies, where men are identified as more vulnerable to ill health due to the construction of a masculine ideal [70, 236]. In addition, the fact that almost 20 % of the HIV-positive men and 35 % of the HIV-positive women on ART did not use condoms illuminates a real and threatening source of ongoing HIV transmission within an informal settlement where social vulnerability is already high. Programmes that target such high risk behaviours among identified HIV-positive patients on treatment are urgently needed, to minimize these risks. The existence of sexual networks that are concurrent is a key feature for HIV transmission. Hence there is a need for further exploration of the construction of these sexual networks and the underlying meanings and supporting elements in place for them to exist.

Furthermore, there was a relationship showing inconsistent condom use to be associated with shorter time on ART. This is likely to be associated with the fact that the majority were diagnosed with HIV and were in need of ART at the same point, and hence needed time in the ART programme to adjust to the idea of living with HIV. On the positive side, it shows that

once patients have had a chance to accept and adjust to being HIV-positive, the counselling received appears to have an effect on behaviour. On the other hand, these results are especially worrisome given the natural course of the disease where viral loads are usually very high at treatment initiation, and then decrease over time. Patients who have recently started on ART are therefore especially important in terms of risk of transmission, and the research results indicate a strong need to focus more on this vulnerable group.

The time factor in ART programmes was also found to be important in two recent studies, where individuals before initiating ART or just starting medication reported more unsafe sexual practices compared to those who were more treatment experienced [228, 237]. Furthermore, the differences we found between the sexes highlight a need for a better contextual understanding of gender dynamics in prevention strategies, and for better support mechanisms to meet the specific needs of men and women. The importance of preventive interventions in conjunction with ART to reinforce safe sexual practices among patients has been identified [139, 237, 238], but more research is needed to build an evidence base for programmatic and policy decisions [226].

Factors to be considered in prevention strategies for biological interventions

The ways people live their sexual life are highly contextual, and therefore, biomedical interventions and strategies need to be coupled with other supporting elements for increased community effectiveness. Contextual or environmental factors that influence risk behaviours, or other determinants of infection or morbidity are pertinent, which pushes for more comprehensive programmes beyond the characteristics of the individual [148]. For example, idealised masculinities in townships (Papers I-III) hold elements such as high sexual risk taking that are firmly promoted in context and thus, in a systematic manner promote ill health among men and women in general as well as creating a fertile ground for HIV transmission. Furthermore, the socio-cultural context of people, for example the pressure to reproduce, creates barriers for behaviour change and sexual risk reduction strategies (Paper IV), which highlights the need for more comprehensive preventive interventions and support to people living with HIV, moving from the individual towards proximal and structural levels in preventive designs for increased community effectiveness in biomedical interventions. This includes actions implemented as policies or programmes that aim to change the conditions in which people live [147]. Successful prevention requires knowledge of the context specific nature of the epidemic including socioeconomic and cultural factors such as poverty, gender, human rights, politics and religions, that all affect the spread of the virus [2]. Thus, the different levels described previously in the background, individual, proximal and distal, form part of successful programme design and are required in order to have an impact on sexually transmitted HIV. However, the view that biomedical preventions have to be coupled with other supporting structures is not new, but it needs to be re-emphasized as many programmes lack an emphasis in reality nor are these components supported financially by many donors. Given that the risk factors associated with sexually transmitted HIV include inconsistent condom use and multiple sexual partners as well as the effects of alcohol (Papers I – V), any biomedical biased intervention will have low community effectiveness. This applies to all biomedical strategies until there is a vaccine available that works effectively. As previously stressed, personal factors i.e., cognition and feelings about sexual behaviours and HIV, self-esteem, and self-efficacy are important, but so are proximal factors which deal with interpersonal relationships and an individual's physical

environment as well as structural factors such as the traditions, norms, shared beliefs, values, legal, political, economical, organizational and other socio-demographic elements of the society.

With all of these, and many more types of initiatives and interventions for HIV prevention, governments, donors and global agencies must be accountable for prevention programming. They must ensure that investment is tailored to the specific characteristics of national epidemics [85]. By ensuring this, the weakness in previous program designs will be altered from the very narrow focus on the individual, the lack of contextual knowledge about where the epidemic appears and the poor understanding of the construction of sexuality in the social context. Many such approaches were highly value laden and had a moral outlook based in cultural or religious beliefs. There is a critical need to bring in gender as a key determinant as it has been widely stressed that, individual action might not be an option where women (and men) are without personal control and power [83]. Thus, sexual behaviour strategies are highly pertinent, but need to become more sophisticated and used in combination with advances in the biomedical field [84].

METHODOLOGICAL CONSIDERATIONS

Study designs

Data generated in the thesis made use of two different study designs. Qualitative data, Sub-studies 1+2 (Papers I, II, III, IV) were based on two sets of in-depth interviews. The in-depth interviews were preceded by a thorough situational analysis [168] which included secondary data analysis and discussions with clinic staff to define key themes and identify gaps in existing data and information. This process ensured the utilisation of already available information, as well as identifying gaps in the existing data, which may have been outdated, imprecise or incomplete. This preparatory work was central to the process of developing a Thematic Question Guide (TQG) with open-ended questions that was used during the interviews. The TQG was pre-tested prior to the in-depth interviews to sensitise questions that aimed at exploring sensitive issues such sexual behaviour and actual risk taking and risk reduction strategies. The TQG was used to guide the interviews, while allowing the interviewer to freely explore, probe, and ask questions to expand on or to clarify specific issues. The interviews were thus more focused to help the interviewer touch upon themes identified in the situation analysis and two different TQGs for Sub-study 1 and 2 were developed to match these gaps (Appendix 1 and 2).

Quantitative data (Paper V) were generated from a cross-sectional survey. In cross-sectional studies, investigators assess all individuals in a sample at the same point in time, often to examine the prevalence of exposures, risk factors or disease. Some cross-sectional studies are analytical and aim to quantify potential causal associations between exposures and disease [239]. The cross sectional survey was chosen because relative risk and prevalence calculations do not require information across time periods [240], but are helpful in assessing the frequency of certain outcomes and behaviours as well as health care needs of a population [241].

The contexts for data collection

Sub-study 1 (Papers I, II, III) was unique in terms of the violent context in which the research was carried out, and we believe we managed to reach males who normally are difficult to involve in research. The risks of working in settings like Khayelitsha are several and the township has a notorious reputation when it comes to violence, drugs and other social problems. The study was based initially at a TB clinic located in the township, but had to be changed due to people breaking into the venue. It became known that airtime vouchers were given to participants as appreciation for the time given. The study was then relocated to the emergency ward at the hospital, which has guards. However, this did not completely protect the research team, who were under constant threat in terms of patients and study participants showing up drunk and/or under influence of others substances, often with very aggressive attitudes.

In Kibera, Kenya, Africa's biggest slum area where people live under extreme circumstances, the risk for robbery and violence is constantly close at hand. Most organizations working in

the area escort their staff when visiting sites, which was not part of the set up for our research team. The already high risk area became even more so during the elections in 2007, when riots, murder, violence and rapes escalated due to severe conflicts between the leading parties as well as ongoing tribal conflicts. During December 2007, staff and patients were not able to come to the clinic due to these conflicts and the high risk of potential violence [242].

The concerns were discussed within the Swedish research team as well as with our South African and Kenyan partners and a safety principal had to be applied. The studies would have gained more if more ethnographic work had been undertaken allowing participation in communities for observation of modes of behaviours and the organization of social lives [243], but due to the high risk situation, for both researchers and assistants, this was difficult to achieve.

Sampling bias and external validity

For Sub-studies 1 and 2, purposive sampling was applied targeting a particular group of hard-to-reach males. A total of 20 men in each setting (Sub-studies 1+2) were interviewed in-depth for the qualitative component of the research. More men were actually interviewed, but due to reasons such as the interviewees being under the influence of alcohol/drugs or being incoherent in speech due to mental illness or other reasons, the interviews were stopped and removed from the data collection. However, it is normally considered that qualitative interviews should continue until saturation is met, and this was achieved before we reached a total number of 20, but we continued the interviews with some more men to make sure enough data of quality had been collected.

Sub-study 1 (Papers I, II, III) was based on a selected group of men at high risk of sexually transmitted HIV in one specific urban environment in South Africa and the findings might only be representative of this group of men. Furthermore, the inclusion criteria had a strict frame, which necessitated a search for men with an age disparity in sexual relations so the preconditions were already given prior to the research and it is difficult to draw any wider conclusions about the general population due to this. However, other studies in the region have pin-pointed differences between men and women in terms of age as an important component in HIV transmission. In Sub-study 2 (Paper IV), the results might be biased as the participants did not represent a broader spectrum of men in the community, for example young and unmarried men were difficult to identify and this might affect the results of the study. However, we believe that this unique opportunity to reach men in this harsh urban setting provides important new knowledge on how contemporary masculine ideals affect gender dynamics that needs to be addressed in HIV prevention programmes.

Paper V was conducted among HIV patients attending a community-based health clinic in Kibera run by AMREF. During the time period September 2007 - April 2009, all male and female patients above 18 years of age were deemed eligible to participate in the study and were recruited consecutively as part of a prospective cohort study conducted during their routine clinical follow up visits at the AMREF clinic. A total of 515 patients (348 women and 167 men) consented to participate and provided complete data. None of the patients denied participation in the study. However, we cannot account for patients who have dropped out from the treatment programme, and hypothetically there might be an association between staying in the programme and adapting to preventive messages.

Internal validity

Information and recall bias is an important component in qualitative research as well as the probability of giving information that is not accurate due to social desirability where the risk of over-reporting good behaviour or under-reporting bad behaviour occurs. The risk of social desirability was present in all sub-studies, not least as it targeted people's sexual behaviours, which are of a delicate nature to many people. For Sub-studies 1 and 2, interviews followed the TQG, but the interviewer could go back and discuss issues if the interviewee contradicted himself for further clarification on sensitive issues. Furthermore, self-reported data does not determinate the actual or complete structure of either social and sexual networks or the underlying reasons for the formation or action taken for sexual risk reduction. However, these in-depth interviews gave the interviewees an opportunity to describe the quality and quantity of their social and sexual relationships as well as their risk reduction strategies and behaviour change (Sub-study 2, Paper IV) and shed light on the normative systems that legitimise their behaviours in these urban settlements. These norms represent a masculine ideal supported in male clusters and accepted in the society at large. All interviews were based on self-reported views on sexuality, sexual networks and social relations, HIV, and risk reduction strategies, based on a very small sample that were randomly selected and may therefore be difficult to generalise to the general population. The same applies for Paper IV, where patients were asked to describe their sexual life before and after the initiation of ART.

Paper V was based on a cross-sectional survey and thus had low potential of a recall bias since respondents were not asked to remember exposures far back in time. Bias is any trend in the collection, analysis, or interpretation of data that can lead to conclusions that are systematically different from the truth. The survey included retrospective, self-reported information on sexual behaviour and events, which are inherently sensitive issues and therefore even more likely to be biased. The recall period was 6 months, which might affect people's ability to accurately remember details of sexual events as well as the probability of giving information that is not accurate due to social desirability. However, the likelihood that patients' memories of risk behaviours would differ by outcome status in this study is highly unlikely, in turn minimizing the risk of this type of information bias. Also, the research assistants were trained to minimize bias and help facilitate patients to answer questions correctly. Nonetheless, the study was based on self-reported sexual behaviour which might be biased, not least in relation to social desirability. One example is that 28% did not answer the question on condom use. Given the stigma around admitting to risk behaviour in the programme setting as well as talking about sexuality issues, especially among older patients, we deem the missing data to have diluted our findings of associations with sexual risk taking. However, research assistants were trained to minimize bias and help facilitate patients in answering questions. We could not explore concurrency in relationships as the total number of reported sexual partners during the previous six months could involve both concurrent as well as serial relationships.

Interview, language and other information bias

Recall bias, an important form of information bias that affects internal validity in quantitative studies, has been discussed above. With regards to qualitative data, the use of in-depth interviewing aimed at exploring specific questions defined in the situational analysis and were considered the best method to extract new knowledge. This is however, a skill-demanding task, not least

due to the sensitive issues addressed as well as to the cross cultural nature of the research. Cultural competence is thus central to the data collection process including: cultural awareness and knowledge, which includes self-awareness of the researcher's different background and knowledge of the cultural background of the informant and communication patterns. It further includes cultural desire and encounter, dealing with the recognition of cultural differences by having respect for cultural diversity and a receptive attitude during the interviews [176]. Following the cultural competence perspective, in-depth interviews as a qualitative research technique is a unique process, especially in a cross cultural situation, where the aim was to explore social environments. In that specific interview situation, several factors are present influencing the process [244] (figure 4).

Figure 4

Research-specific factors	Participant-specific factors	Context-specific factors
<ul style="list-style-type: none"> - Interviewing skills - Preparedness - Control of process - Knowledge of culture and environment - Ability to establish rapport - Communication skills 	<ul style="list-style-type: none"> - Level of anxiety - English proficiency - Desire to please - Educational levels - Social status - Alcohol/drugs 	<ul style="list-style-type: none"> - Location - Time - Cultural mores - Ethical issues

These factors affect the interview process and have to be addressed before entering the field and that unique interview scenario. Undertaking extensive training in qualitative interview techniques, performing a situation analysis, pre-testing of the TQG and informing the informants before the interviews, were all ways to address these factors.

CONCLUSIONS

- Norms that endorse and encourage concurrency in sexual relationships and unprotected temporary sexual encounters as a way to express and enact manhood will need to change in order to reduce HIV transmission. It is important that future HIV interventions targeting high-risk populations in Africa go beyond increasing condom use, to include both a reduction in the number of sexual partners and the formation of large concurrent and sexual networks. This requires innovative methods that contest current norms of masculinity to allow behavioural change not just on an individual level, but also at a societal level where sexual risk reduction strategies should be reinforced.
- Given the close-knit relationships within male peer groups and the strong probability of peer pressure within such groups, interventions targeting groups rather than individuals could be more effective. Individuals might be unable to resist pressure to conform to dominant male norms promoting multiple sexual relationships characterized by exchange and heavy alcohol use when interacting with their peers. Furthermore, the implicit peer pressure for men to engage in transactional sex might be amenable to the influence of popular opinion leader interventions and community interventions. Such interventions employ popular and respected men who are recruited and trained to influence others in their social networks through visible (positive) example and dialogue.
- HIV prevention interventions need to place a greater emphasis on addressing the underlying norms and behaviours that facilitate risky sexual behaviours among those men who drink alcohol at excessive levels; specifically those norms that are integral to perceptions of a dominant masculinity ideal in urban informal settings. Structural approaches to limit people's drinking, such as targeted interventions at shebeens and among male groups using alcohol to access sexual partners and networks need to be explored as there are clear links between sexual behaviours, HIV transmission and alcohol in these urban settings.
- Interventions that address women's dependency on transactional sex as a means of income and/or source of desired material goods are evidently needed to enable them to resist sexual relationships characterized by material exchange. It is evident that future research should gather the perspectives of women who frequent the drinking venues and engage in the transactional sexual relationships described here.
- We found strikingly high levels of inconsistent condom use among men and women on ART in a poor resource setting as well as a high number of married men reporting multiple partners during the previous six months. Thus sexual risk taking was prominent, not least among those who recently started ART. Any of those strategies must be paired with other preventive intervention to increase the probability of community effectiveness to actually have a real effect on the HIV epidemic. This must also be considered by policy makers and the donor community when developing future interventions and support of biomedical intervention.

- As sexual behaviours are deeply imbedded in the local context where men are sexually socialised, traditional structures might potentially serve as focal entry-points for future preventive actions, where prevention efforts should focus on changing underlying masculine ideals and gender relations that promote and maintain concurrent and temporary sexual relationships as well as other high risk behaviours. However, this needs to be further researched, trying to explore the potential in using traditional structures in intervention strategies by testing innovative and potential intervention models.
- The fact that many men are diagnosed with HIV at a very late stage in the disease progression needs to be addressed in order to reduce the risk of sexual transmission of HIV. Partner testing e.g. at antenatal care is one structural intervention that could, if coupled with other counselling strategies and support, reach more men at a much earlier stage of the infections. Partner testing could also reach into high risk sexual networks among hard-to-reach populations. This strategy needs to make use of existing strategies, bringing in, not only PMTCT programmes, but also STI clinics to more broadly address sexual and reproductive health issues including HIV.

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Cover picture - During the 14th Century, the Black Death killed large numbers of the European population. In desperation, people prayed for the intercession of a saint, which was Saint Sebastian. He was declared patron of plague sufferers of his reported cures of those afflicted with many diseases. St Sebastian - oil on canvas by Douglas Oliver Walker, thanks for letting me use this painting as I always liked it and is associated with the theme of this thesis

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APPENDIX I

1.0 Introduction

This qualitative study is developed back to back and will support the interpretation of and help in the intervention design of a previously granted study called “The development of a surveillance system for men at high risk of HIV in the Western Cape”. There is a need of additional qualitative components to get an in-depth understanding of young males and their self-ascribed (sexual) identity, norms and sexual networks for future development of intervention among this hard-to-reach group, i.e. hard-to-reach, high risk male population in urban townships. Informants for this study will be identified from the pool of individuals recruited in the quantitative study, i.e. seeds from the respondent-driven sampling (RDS) method. For the qualitative study, approximately 20 informants will be interviewed or until saturation is met as is common practice in qualitative studies. This study will follow the same ethical standard and strict criteria on risk to human subjects as the main study.

2.0 Objectives

The aim of this qualitative study is to get a better understanding of sexual identity, norms and sexual networks in a hard-to-reach, high-risk male population in Khayelitsha.

Specific aims:

- To explore social norms regarding gender and sexual identities among young males.
- To explore social and sexual networks among the target population in terms of places where socializing and meeting of new sexual partners takes place;
- To explore sexual behaviors and sexual risk reduction strategies

3.0 Data collection and analysis

Two members of the research team shall be present at the discussions. One of the researchers will mainly moderate the discussion, while the other will observe and take notes. Discussions will last up to 1 1/2 hours. The aim of these interviews is to obtain the informants’ view on set objectives.

The method of “open coding” forms the basis of the analysis. Open coding involves a line-by-line analysis of the transcripts in order to: i) label phenomena; ii) identify concepts; and iii) group the concepts into categories. The transcripts are read and categories are reviewed several times in order to ensure that concepts pertaining to the same phenomena are placed in the appropriate category. The range of views expressed within each code is summarized into overview grids or tables. A method of thematic coding and analysis is employed. The initial thematic codes arise from the thematic question guide. Subsequent codes emerge from close reading of the transcripts. Draft analyses of each coded major topic, based on the overview grids and original coded material, is then discussed in detail by the research team. NVivo 7, a computer based program will be used in the analysis.

3.0 Thematic Question Guide (TQG)

A thematic question guide (TQG) with open-ended questions will be used in primary data collections, which will address specific thematic areas. The TQG will help facilitate the work in planning, collecting and managing the data and prepare a feasible structure for the interviews. The TQG targets core issues to help the researcher to freely explore, probe, and ask questions that will elucidate and illuminate that particular topics. Themes that will be covered are:

Theme 1. Identification of characteristics and hierarchies in and between networks

- a) What types of men who have many younger partners are there in Khayelitsha?
- b) What do you call the different types/groups of men?
- c) What is it about this man that makes him popular or respected?
- d) How would you label him?

Theme 2. Males self-ascribed sexual identity on an individual level

- a) What does it mean to be a man?
- b) How do you view your sexual life since you became sexually active (sexual life-line)?
- c) What does sexual intercourse and intimate relations mean to you?
- d) How do you see yourself as a man and sexual partner?

Theme 3. Norms and perceptions of sexual relationships and multiple partners.

- a) What do you think about men having many sexual partners?
- b) How do you think others perceive men with many partners?
- c) What do you think of the women you have sex with?
- d) What do your peers expect from you?

Theme 4. Barriers and supporting factors to reduce the number of sexual partners.

- a) How easy would it be for you to change aspects of your sexual behavior to reduce your risk of contracting / transmitting HIV?
- b) What aspect of your sexual behavior would you be willing to change?
- c) How important is it to you to have more than one long-term sexual partner and remain faithful to her?
- d) What things would make it hard for you to have only one long-term sexual partner and remain faithful to her?

APPENDIX II.

A Thematic Question Guide will be used in primary data collection and will address specific thematic areas for different clusters of respondents. The question guide will help facilitate the work in planning, collecting and managing the data and in preparing a feasible structure. The TQG targets core issues to help the researchers freely explore, probe, and ask questions that will elucidate and illuminate that particular topic. The TQG contains open-ended or semi-opened questions and serves as a basic checklist. Each theme contains several underlying questions allowing the researchers to word questions spontaneously, but with the predetermined subject in mind. The TQG covers two major areas.

First, descriptive questions dealing with attitudes towards sexual encounters and relationships and levels of knowledge among people enrolled in an ART programme. Secondly, to explore men's and women's self-reported sexual behaviour and risk reduction strategies before and after enrolment in ART programmes. Informants are interviewed many times, using information from previous interviews to elicit clarification upon re-interview. The method is also considered to be suitable when trying to extract sensitive information and a more in-depth understanding of phenomena.

General objective

The general objective is to explore sexual behaviours among HIV-positive men enrolled in ART to investigate how treatment affects sexual behaviours and risk-reduction strategies to create more supportive and sustainable models in relation to ART programmes. .

Specific aims

- 1) To explore changes in behaviours and attitudes after enrolment in the ART programme
- 2) To explore the symbolic understanding of sexual encounters (including sexual coercion) among people enrolled in ART programmes from a gender perspective
- 3) To explore patients' reception and realisation of information given in ART programs
- 4) To explore distal factors that support or hinder risk reduction strategies

Theme 1: To explore changes in sexual behaviour and risk reduction strategies before and after enrolment in ART programme

- a) In what ways has your sexual life changed since you got to know your HIV status
- b) In what ways has your sexual life changed since you started on medication?
- c) In what ways do you protect yourself and others today?
- d) Why is it important to you to take precautions?
- e) What is easy or difficult in taking precautions?
- f) What aspect of your sexual behaviour would you be willing to change?
- g) Where can you find support for sexual risk reduction strategies?

Theme 2: To explore the symbolic understanding of sexual encounters (including sexual coercion) among people enrolled in ART programmes from a gender perspective

- e) How do you view your sexual life since you became sexually active (sexual life-line)?
- f) What does sexual intercourse mean to you as a man/woman?
- g) What expectation do you have as a man/woman when it comes to sexual intercourse or intimate relations in your community?
- h) How many sexual partners do you have?

Theme 3: To explore patients' reception and realisation of information given in ART programmes regarding sexual risk behavior

- a) From where do you get information on sexuality and ART?
- b) What kind of information have you received concerning sexual encounters?
- c) In what way do you think this information fits into your life?
- d) What information do you make use of and what is not relevant?

APPENDIX III.

Questionnaire

Adherence Baseline Questionnaire AMREF, Kibera

Date: _____ OP/No : _____

Name of health care provider completing this form: _____

The answers you give on this form will be used to plan ways to help other people who must take pills on a difficult schedule. Please do the best you can to answer all the questions. If you do not wish to answer a question, please draw a line through it. If you do not know how to answer a question, ask your interviewer for help. Thank you for helping in this important study.

Please check one of the options below

A. Sociodemographic characteristics

1. Sex

1. Female ☐
2. Male ☐

2. Age _____

3. Which ethnic group do you belong to?

1. Luo ☐
2. Kisii ☐
3. Kamba ☐
4. Kikuyu ☐
5. Maasai ☐
6. Luhya ☐
7. Nubien ☐
8. Somali ☐
9. Other ☐ Please specify: _____

4. Which religion do you belong to?

1. Protestant ☐
2. Catholic ☐
3. Muslim ☐
4. Other ☐ Please specify: _____

5. What is the highest level of education you have achieved?

1. Never been to school ☐
2. Primary school ☐
3. Secondary school ☐
4. Tertiary/vocational school ☐
5. University ☐

6. What is your present occupation?

- | | | |
|----|---------------|--|
| 1. | Employed | <input type="checkbox"/> |
| 2. | Self-employed | <input type="checkbox"/> |
| 3. | Unemployed | <input type="checkbox"/> |
| 4. | Casual labour | <input type="checkbox"/> |
| 5. | Other | <input type="checkbox"/> Please specify: _____ |

7. How much do you earn in a month?

- | | | |
|----|-----------------|--------------------------|
| 1. | < Ksh 1000 | <input type="checkbox"/> |
| 2. | Ksh 1000-5000 | <input type="checkbox"/> |
| 3. | Ksh 5000-10,000 | <input type="checkbox"/> |
| 4. | > Ksh 10,000 | <input type="checkbox"/> |

8. What is your marital status?

- | | | |
|----|----------------------------------|--------------------------|
| 1. | Married to one partner | <input type="checkbox"/> |
| 2. | Married to more than one partner | <input type="checkbox"/> |
| 3. | Widow/widower | <input type="checkbox"/> |
| 4. | Single | <input type="checkbox"/> |
| 5. | Divorced/separated | <input type="checkbox"/> |

9a. How many people do you reside with, excluding yourself?

- | | | |
|----|-----|--------------------------|
| 1. | 1 | <input type="checkbox"/> |
| 2. | 2-3 | <input type="checkbox"/> |
| 3. | 4-5 | <input type="checkbox"/> |
| 4. | ≥6 | <input type="checkbox"/> |

9b. What is the nature of relationship of those you reside with?

(You may check more than one option)

- | | | |
|----|----------------------|--|
| 1. | Wife/husband/partner | <input type="checkbox"/> |
| 2. | Children | <input type="checkbox"/> |
| 3. | Friends | <input type="checkbox"/> |
| 4. | Relatives | <input type="checkbox"/> |
| 5. | Other | <input type="checkbox"/> Please specify: _____ |

10. How many biological children do you have?

- | | | |
|----|-----|--------------------------|
| 1. | 0 | <input type="checkbox"/> |
| 2. | 1 | <input type="checkbox"/> |
| 3. | 2-3 | <input type="checkbox"/> |
| 4. | 4-5 | <input type="checkbox"/> |
| 5. | 6-7 | <input type="checkbox"/> |
| 6. | ≥8 | <input type="checkbox"/> |

11. How many people are you supporting financially (exclude self)?

- | | | |
|----|-----|--------------------------|
| 1. | 0 | <input type="checkbox"/> |
| 2. | 1 | <input type="checkbox"/> |
| 3. | 2-3 | <input type="checkbox"/> |
| 4. | 4-5 | <input type="checkbox"/> |
| 5. | 6-7 | <input type="checkbox"/> |
| 6. | ≥8 | <input type="checkbox"/> |

12. Are you living in Kibera?

- | | | |
|----|-----|--|
| 1. | Yes | <input type="checkbox"/> |
| 2. | No | <input type="checkbox"/> Please specify and skip next question |

13. How long have you been living in Kibera?

1. 0-2 years ☐
2. 2-5 years ☐
3. >5 years ☐

14. How long does it take you to reach the clinic from your residence?

1. Less than 10 minutes ☐
2. 10-30 minutes ☐
3. 31-60 minutes ☐
4. More than one hour ☐

B. Transmission, ART initiation, social support

1. How long ago did you learn your HIV status?

1. < 6 months ☐
2. 6-12 months ☐
3. 1-2 years ago ☐
4. >2 years ago ☐

2a. Have you disclosed your HIV status to anyone?

1. Yes ☐
2. No ☐

2b. If yes, please state who:

(You may check more than one option)

1. Partner ☐
2. Friend ☐
3. Relative ☐
4. Other ☐ Please specify: _____

3. How long have you been on ARVs? (Year, month(s)) _____

4. Where did you get your drugs from the beginning?

1. AMREF ☐
2. MSF ☐
3. From a friend ☐
4. Buy from private vendor ☐
5. Other ☐ Please specify: _____

5. Have you ever taken any other medication during your use of ARVs?

(You may check more than one option)

1. None ☐
2. Herbs ☐
3. Other ARVs from other organizations ☐
4. Drugs for Opportunistic Infections ☐
5. Other ☐ Please specify: _____

6. Do you have a treatment buddy?

1. Yes ☐
2. No ☐

7. In general, are you satisfied with the overall support you get from your friends and family members?

1. Yes ☐
2. No ☐

8. Do your friends or family members help you remember to take your medication?

1. Yes ☐
2. No ☐

C. Adherence

1. When was the last time you missed taking any of your medications? Check one box

1. ☐ Within the past **week**
2. ☐ 1-2 **weeks** ago
3. ☐ 2-4 **weeks** ago
4. ☐ 1-3 **months** ago
5. ☐ More than 3 **months** ago.
6. ☐ **Never** skip medications or **not applicable. If so, skip the next question**

People may miss taking their medications for various reasons. Here is a list of possible reasons why you may have missed taking any medications within the **past 3 months**. If you have **NOT** taken **any** medications within the **past month**, skip to next question

2. In the past 3 months, have you ever missed taking your medications because you:

Please check one response for each question; yes or no

- | | | |
|---|------------------------------|-----------------------------|
| 1. Were away from home? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2. Were busy with other things? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 3. Simply forgot? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4. Had too many pills to take? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 5. Wanted to avoid side effects? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 6. Did not want others to notice you taking medication? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 7. Felt like the drug was toxic/ harmful? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 8. Fell asleep/ slept through dose time? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 9. Felt sick or ill? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 10. Felt depressed/ overwhelmed? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 11. Had problem taking pills at specified times (with meals, on empty stomach, etc.)? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 12. Ran out of pills? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 13. Felt good and did not need to take the drugs? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 14. Took traditional medicine instead? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 15. My religion didn't allow me to take the pills? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

D. Alcohol and other drugs

1. How often have you had a drink containing alcohol – a glass of beer, changaa, karobo, busaa- in the past 30 days?

1. Daily ☐
2. Nearly every day ☐
3. 3 or 4 times a week ☐
4. Once or twice a week ☐
5. Two or three times a month ☐
6. Once a month ☐

7. Never ☐
8. Not applicable ☐

2. When you drank alcohol in the last 30 days, how many glasses did you drink altogether at each occasion? (One bottle equals two glasses, one container equals 2 glasses)

1. 1-2 glasses per day ☐
2. 3-4 glasses per day ☐
3. 5-6 glasses per day ☐
4. 7-8 glasses per day ☐
5. 9-10 glasses per day ☐
6. 11-12 glasses per day ☐
7. ≥ 13 glasses per day ☐

3. Have you used Heroin, Marijuana, Cocaine (Bhang), Miraa, Khat or any other drug in the past 30 days?

1. Yes ☐ If yes, check below
2. No ☐

1. Heroin ☐
2. Marijuana ☐
3. Cocaine (Bhang) ☐
4. Khat ☐
5. Other ☐ Please specify: _____

E. Sexuality

1. What is (are) the most likely ways(s) that you became infected with HIV?

Check one

1. Sex with a man who was HIV+ ☐
2. Sex with a woman who was HIV+ ☐
3. Shared needles with a person who has HIV+ ☐
4. Blood transfusion or other medical procedure ☐
5. Don't know ☐
6. Raped ☐
7. From my mother at birth ☐
8. Other ☐ Please specify: _____

2. How old were you when you first had penetrative sexual intercourse? _____

3. How many sexual partners have you had sex with in the past 6 months? _____

1. 0 ☐
2. 1 ☐
3. 2 ☐
4. ≥ 3 ☐

4a. Compared with six months ago, how has your desire for sex changed?

1. My desire for sex has not changed ☐
2. My desire for sex has increased ☐
3. My desire for sex has decreased ☐

4b. If not sexually active, please fill in why

1. Not feeling well (physically or mentally) ☐
2. Decreased desire to have sex ☐

3. No partner ☐
4. Other reason ☐ Please specify: _____

5a. How often do you use condoms when having sexual intercourse?

1. Never ☐
2. Rarely ☐
3. Sometimes ☐
4. Often ☐ Please specify if needed: _____
5. Always ☐ (If always, skip next question)

5b. Why do you not always use a condom?

1. Not always available ☐
2. Too expensive ☐
3. Partner refused ☐
4. Don't like them ☐
5. Used other contraceptive ☐
6. Did not think it was necessary ☐
7. Did not think of it ☐
8. Do not know ☐
9. Other ☐ Please specify: _____

6. What are you doing to reduce the risk of HIV transmission?

1. Use of condom ☐
2. Reduction of number of partners ☐
3. Abstinence ☐
4. Nothing, not a concern ☐
5. Other ☐ Please specify: _____

F. The following questions ask about symptoms you might have had during the past four weeks. Please check (yes or no) if you have had any of these symptoms

- | | | |
|--|------------------------------|-----------------------------|
| 1. Fatigue or loss of energy? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2. Fevers, chills or sweats? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 3. Feeling dizzy or light-headed? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4. Pain, numbness or tingling in the hands or feet? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 5. Trouble remembering? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 6. Nausea or vomiting? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 7. Diarrhoea or loose bowel movements? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 8. Felt sad, down or depressed? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 9. Felt nervous or anxious | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 10. Difficulty falling or staying asleep? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 11. Skin problems, such as rash, dryness or itching? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

12. Cough or trouble catching your breath? Yes ☐ No ☐
13. Headache? Yes ☐ No ☐
14. Loss of appetite or a change in the taste of food? Yes ☐ No ☐
15. Bloating, pain or gas in your stomach? Yes ☐ No ☐
16. Muscle aches or joint pain? Yes ☐ No ☐
17. Problems with having sex, such as loss of interest or lack of satisfaction?
Yes ☐ No ☐
18. Changes in the way your body looks, such as fat deposits or weight gain?
Yes ☐ No ☐
19. Problems with weight loss or wasting? Yes ☐ No ☐
20. Hair loss or changes in the way your hair looks? Yes ☐ No ☐

Thank you so much for your participation!

(Footnotes)

¹ The Peltzman effect is the hypothesized tendency of people to react to a safety regulation by increasing other risky behaviour, offsetting some or all of the benefit of the regulation